

FLIGHT

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A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

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EDITORIAL COMMENT.

The Safety Aeroplane.

There appears to exist at the backs of the minds of many who talk about flying an idea that the advent of the "safety" aeroplane is only a question of time. By "safety" they appear to mean a machine on which even a fool will experience difficulty in breaking his neck. It may be that flying machines of the future will ultimately rival the derelict in sheer persistent "buoyancy," and at the moment it seems to be of some consequence to determine whether it is this or some other quality that people mean when they talk about stability in air at the present time.

Stability is a term that needs to be defined every time it is used, and the more it is used the more necessary it is to repeat the definition. Familiarity seems to have bred contempt for its precise meaning, until the word has degenerated into a term of vague merit, suggesting qualities that are desirable, but leaving undefined whether or no any particular one of them has as yet been realised. Discussions on the subject often originates from two entirely different points of view, and because neither side defines its hypothesis with precision, the rival camps, not unnaturally, experience difficulty in making any marked progress along a common line of thought.

Take, for example, the case of a machine that is, let us say, regarded as worthy because it tends to head into the wind when disturbed. From another point of view, this may be regarded as a demonstration of obvious directional instability. Again, it is possible to demonstrate that certain arrangements of planes will keep their balance in still air, while gliding. They are free to move in any direction, and the direction in which they tend to move depends on their lack of balance, and is always such as to create a restoring force that tends to keep the apparatus in trim and on an even keel.

The experimenter in this field of research, very reasonably, regards himself as being in the presence of a stable system. Change the conditions, however, and the conclusions may with equal certainty be reversed. Argue, for instance, that practical flying takes place in winds. Define a gust as a sudden veering of the wind, and the system that was called stable in still air must be called unstable in windy weather, because the very arrangement that was devised to restore lateral balance by a sidewise movement of the system in calm air will itself be the target against which the gust will strike when the craft is in good trim. Thus we have the interesting condition that machines might be designed from two diametrically opposite points of view, which, to some extent, does indeed appear to be the case to-day. Take, for example, the well-known dihedral system, in which the wings of a machine slope upward from the shoulder, and compare this with the Dunne monoplane, with its down-turned wing tips, and superficially, at any rate, these would appear to be in opposite camps.

Then it is a fact that several machines, and they may even be in the majority when biplanes and monoplanes are considered collectively, have straight wings. That is to say, they are neither dihedral upwards, nor arched, nor have they down-turned extremities; yet, in the hands of a competent pilot, they seem, to the casual observer at least, to fly as well as any.

Apparently, therefore, the practical aspect of the case that is most in view at the moment, in respect to the general run of aeroplanes, is one in which the virtue of such inherent security as the machine may possess in flight depends on some quality that is, in the main, common to all good designs, and only to a secondary extent on peculiarities of individual parts.

Imagine, for example, that the wings themselves tend to check sudden canting, somewhat as the keel of a yacht may damp the effect of a gust on the sail. If a wing tip descended one foot in a second while flying at

60 ft. per second, its angle of incidence is virtually increased by about one degree while the descent continues. It is a matter for investigation whether the practical circumstances of flight are such as make the above argument reasonable, but, adopting it for the moment, it affords ground for arguing that all well-designed aeroplanes have the greater part of their "stability" in common, due to their mere possession of wings. In this case "stability" means sluggishness in rotational movements about the longitudinal axis. It does not imply any power of automatic recovery, which is the essence of stability under the still air hypothesis. To restore balance, the pilot must warp, or perform some other equivalent operation, and so we introduce a new factor into the equation for which neither the mathematics nor the model experiments take account.

Inasmuch as aeroplanes are built to be flown by humans—not to be launched torpedo-like towards a given mark, nor to wander aimlessly about, under the vault of heaven—"stability" becomes more than ever a purely relative term, and quite meaningless unless carefully defined. In fine, its misuse calls forth the justifiable rebuke, "Do we want 'stability?'" which so often falls from the lips of one or another whenever the "stability question" happens to have given rise to a discussion that shows signs of degenerating into a mental stampede into the mysterious and the unknown.

Nevertheless, it is a fact that everyone engaged either directly or indirectly in aviation most heartily desires to reduce the risks that attend the practice of flight. In this desire, all are without exception, of one accord; it is only when there is any attempt to identify the general search with the cult of some particular "stability" that there is apt to be discord in the camp.

To those who seek with an open mind, all sides of the question contribute to the slowly growing store of knowledge. Straight wings, dihedral wings, arched wings and retreated wings, each kind adds its quota. A flight on the Dunne aeroplane without using the control is recorded alongside that made in a wind by Pixton on a Bristol monoplane, for instance, who reported that his warp lever was several times wrenched from his hands. By the side of both stand the hundred-and-one flights that are made any day in the week by pilots who equally have returned to *terra firma* in safety to tell the tale; and beyond the fact of the safe return itself, it is difficult to assess the alleged security of the flight at a hard and fast value.

Accidents are investigated; likewise happenings that were nearly accidents, which sometimes teach far more. On the one side, there is the practical flying; on the other, the practical thought that seeks to correlate events so as to form a composite "experience" in which the work of many may be rendered equally available for the use of all. One form of machinery that the mind uses to assist the process of thought is mathematics, for which reason work like that of Professor Bryan, which is devoted to the algebraic study of abstract principle, should by no means be ignored by practical men.

Mathematics, as Sir George Greenhill remarked in the discussion on Mr. E. H. Harper's paper on the "Mathematics of Aeroplane Stability," which was read before the Aeronautical Society last Wednesday week, re-models the facts, but adds none of its own. You obtain nothing from the "mathematical machine"—as Mr. Archibald R. Low, Engineer of the Vickers aeroplanes, described the science—that you do not put into it in the first instance. Crudely expressed, it yields you the kind of sausage that is appropriate to the meat.

Thus, Mr. Harper's paper, which will be published in *FLIGHT* shortly, should not be regarded as lacking in interest because the field of its investigation is but a small patch of the area already covered in practical flight. Because the real aeroplane carries a pilot and is struck by a gust, it does not necessarily affect the potential value of knowing how a hypothetical system of planes would behave under certain assumed conditions in still air. Criticism of such an investigation must be levelled at the process, that is to say, at the mechanism of the mathematical machine, or not at all; for to direct it at the nature of the result is tantamount to grumbling because an otherwise excellent apparatus refuses to manufacture a pork sausage from beef.

Once the precise character of the problem to be solved has been determined by the man who requires the solution, and the mathematicians are agreed upon the simplest form of machine that will manufacture the desired result from appropriate materials, it remains only for the "practical man" already possessed of certain numerical quantities to insert them in the equation and receive in return a number for the term unknown. If he puts his pennies in the wrong slot, that is hardly to be regarded as the fault of the machine.

It has been explained at some length that there the term "stability" may have several meanings, and that those interested in practical flying are far from agreed as to what particular kind of stability it is that is most to be desired on an aeroplane. Under the circumstances there is nothing for the mathematician to do but to select his hypotheses as best suits his convenience, and as it is a very good rule to begin at the beginning, so does it seem to us very proper that Prof. Bryan should have commenced his investigation of the mathematics of the subject by first considering a very elementary situation, in which many factors complicating the issue in respect to a practical machine are ignored.

To have investigated even so much is already something, and if the practical research with scale models at the National Physical Laboratory helps to define the next problem—as there is no doubt they will, provided adequate funds are allocated to this department next year—then another "turn of the handle" should move the mathematical machine, to produce some still more interesting results. There is no doubt that laboratory research is the great thing needed at present, and we trust that no bar will be placed in the way of the N.P.L. acquiring the means to construct a wind tunnel, and such other apparatus as they may need for the complete measurement of the forces that act on an aeroplane in a variety of different attitudes to the relative wind.

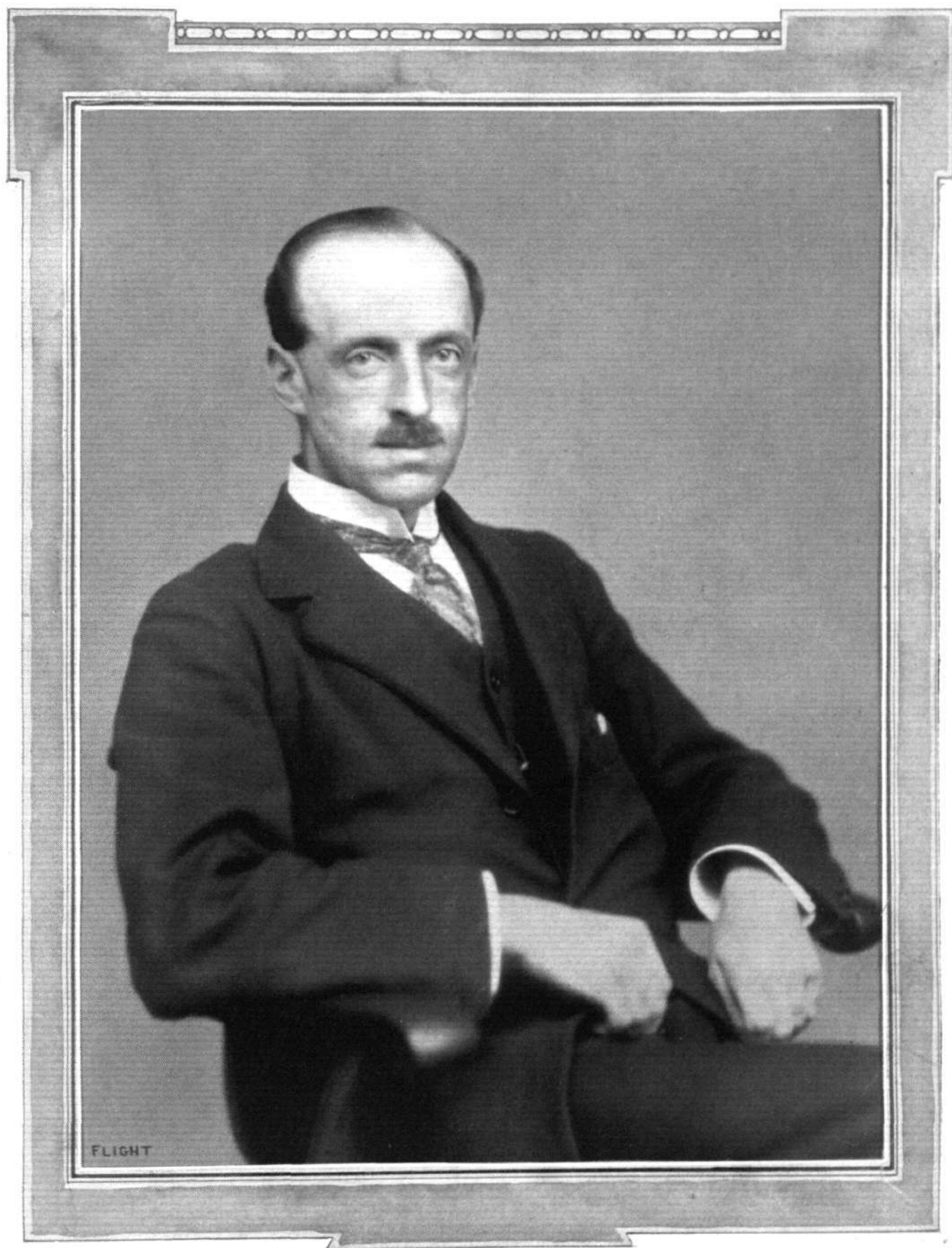
Although, as we have said, Mr. Harper's paper, which is an exposition of the principal theme in Prof. Bryan's book, relates to a strictly limited hypothesis, the general nature of its conclusions are not without practical interest and value, at any rate as a line of thought. Thus, it appears that we may resolve upturned wing-tips, downturned wing-tips, dihedral wings and the like into equivalent fins above or below the backbone of the machine, as the case may be.

It appears to us that the aeroplane that is to be really safe will possess qualities not unlike those displayed by the gyroscope; in other words, the torques engendered by directional control must automatically satisfy the principle of the conservation of angular momentum. It would be interesting to know whether this is not, in fact, the basis of the stability sought by Dunne and others who have tried to evolve the "safety" aeroplane.

DECEMBER 21, 1912.

FLIGHT

MEN OF MOMENT IN THE WORLD OF FLIGHT.



Major F. H. SYKES, 15th Hussars, Officer Commandant in charge of Records, Royal Flying Corps, Military Wing.

THE FLANDERS MONOPLANE.

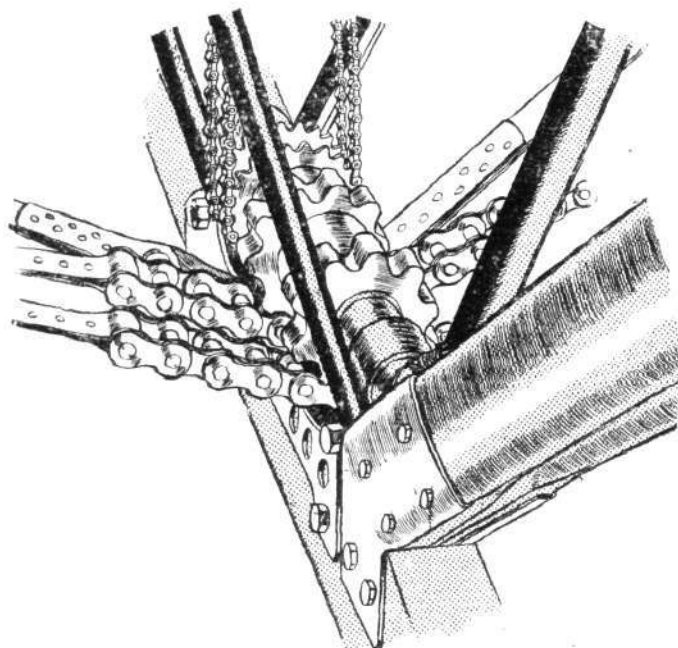
SOME few months since, we devoted an article to describing this extremely interesting monoplane in full. Changes in its design have taken place since then, but as they have affected the detail of the machine more than the general *ensemble*, let us confine ourselves more particularly to its new features.

Of the Flanders monoplanes, readers may recall, the War Office ordered four. Two of these have been delivered to the Royal Flying Corps at South Farnborough; one is, at the time of writing, at Brooklands, being tested and adjusted prior to being flown over to Farnborough; and the fourth has yet to emerge from the firm's works at Richmond.

The main point of difference of this present 70-h.p. Renault engined monoplane from the 60-h.p. Green engined machine we have previously described lies in the landing gear. The early machine was fitted with a central front skid and swivelling wheels that were supported by a deformable triangle of steel tubing, the resiliency being provided by a compression spring which formed the longest side of the triangle. This chassis, although serviceable enough for landing on and taking off from quite rough surfaces, did not satisfactorily withstand the severe rolling test that is imposed by the War Office on machines before they are handed over to the Royal Flying Corps. Landing on and rising from a ground is rather different from rolling over it at, say, 20 miles an hour, for whereas the old type of Flanders chassis could alight on and take off quite comfortably from the test ground on Laffan's Plain, when it came to rolling moderately slowly, the peculiar surface set the machine bouncing so lustily that eventually it gave out. The fault of that chassis, for that particular test, was its extreme resiliency.

The present chassis, however, has been found to be more serviceable, for not only is it stronger, but it is sprung in a manner that does not make the machine tend to bounce to the extent that the old type of landing-gear did. Briefly, the under-carriage is composed of a long central skid of hickory—an excellent wood to use

by reason of its tough fibrous nature—supporting the body through four V set pairs of ash compression struts. Further strength at the skid is provided by two more pairs of steel tubular struts, which run to the skid, and which are there with the primary object of supporting the warping gear. For the skid itself, it is protected in front on the underside by a steel plate, and at its rear the



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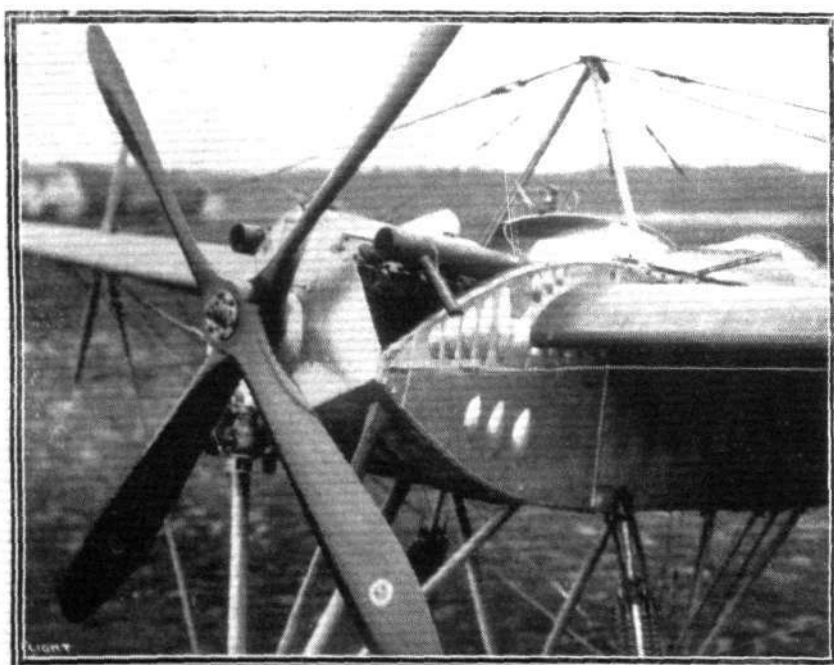
WARPING GEAR ON THE FLANDERS MONOPLANE
—The sprockets taking the stout warping chains are machined from Duralumin.

overhang is sawn longitudinally into three laminations, for that part needs to be flexible on account of its being adjusted to touch ground, and take some of the work from the light tail skid. On either side are the wheels revolving on axles that are hinged to the central skid, and which support the body by a clever form of compression-spring.

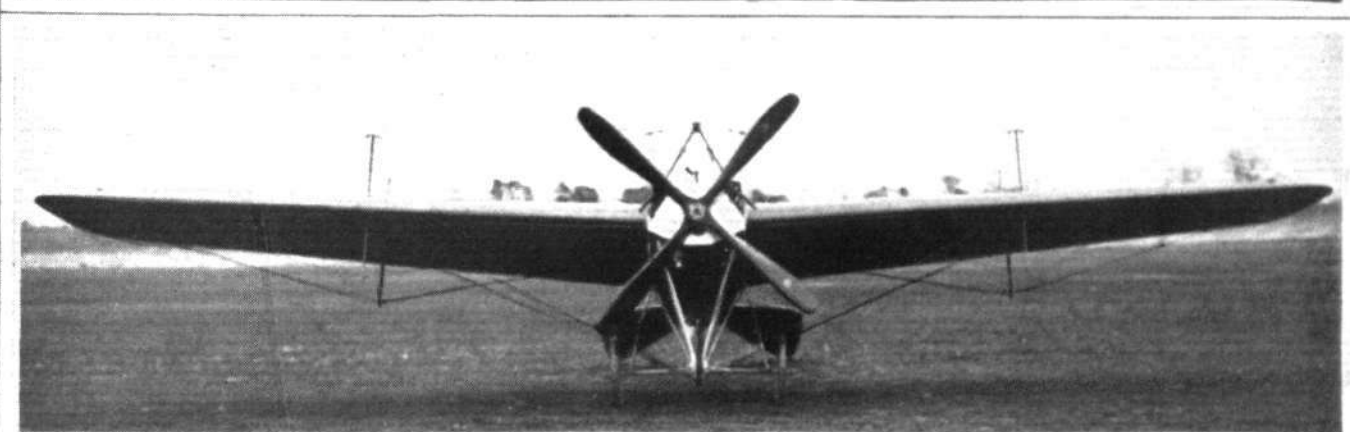
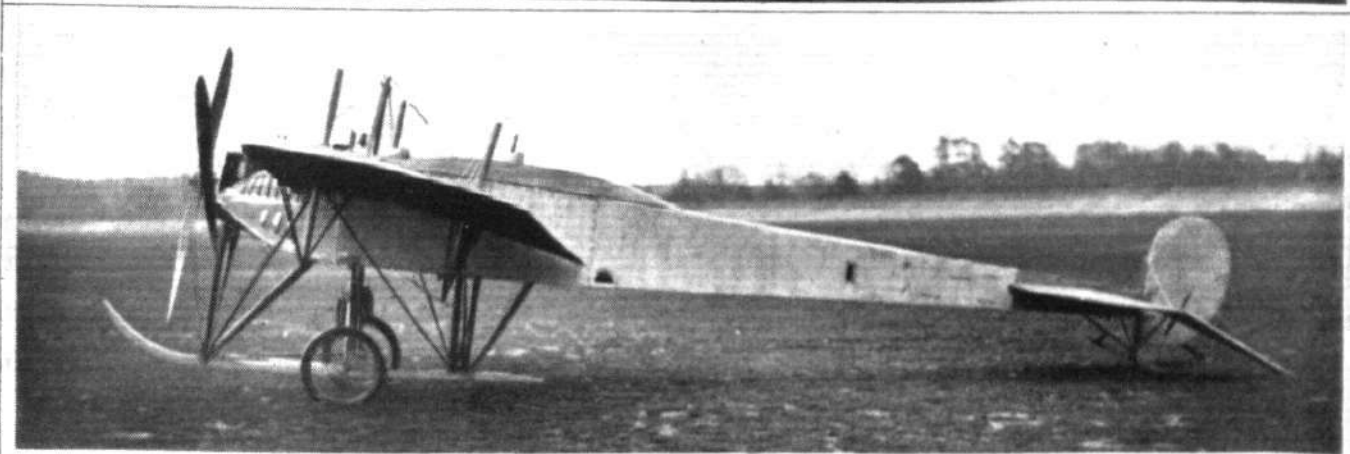
In designing a compression-spring of this "single-tube" type, which derives its ability to withstand compression by means of elastic shock absorbers *in tension*, the chief difficulty has been to overcome the weakness caused by having to split one of the tubes to allow for the travel of the cross-piece to which the tensional springs are attached. This Mr. Flanders arrives at by arranging a third tube over the section where the long slot is cut. If reference be made to one of our accompanying sketches, this detail will undoubtedly be more readily understood.

The wheels are 26 ins. in diameter, and are furnished with 4 in. tyres. Up to the present these wheels have been "disced in" with fabric, but in future models discs of aluminium sheeting are to be employed, as they make a much neater job.

For designers, especially, it is interesting to notice that Mr. Howard Flanders is gradually abandoning his highly original



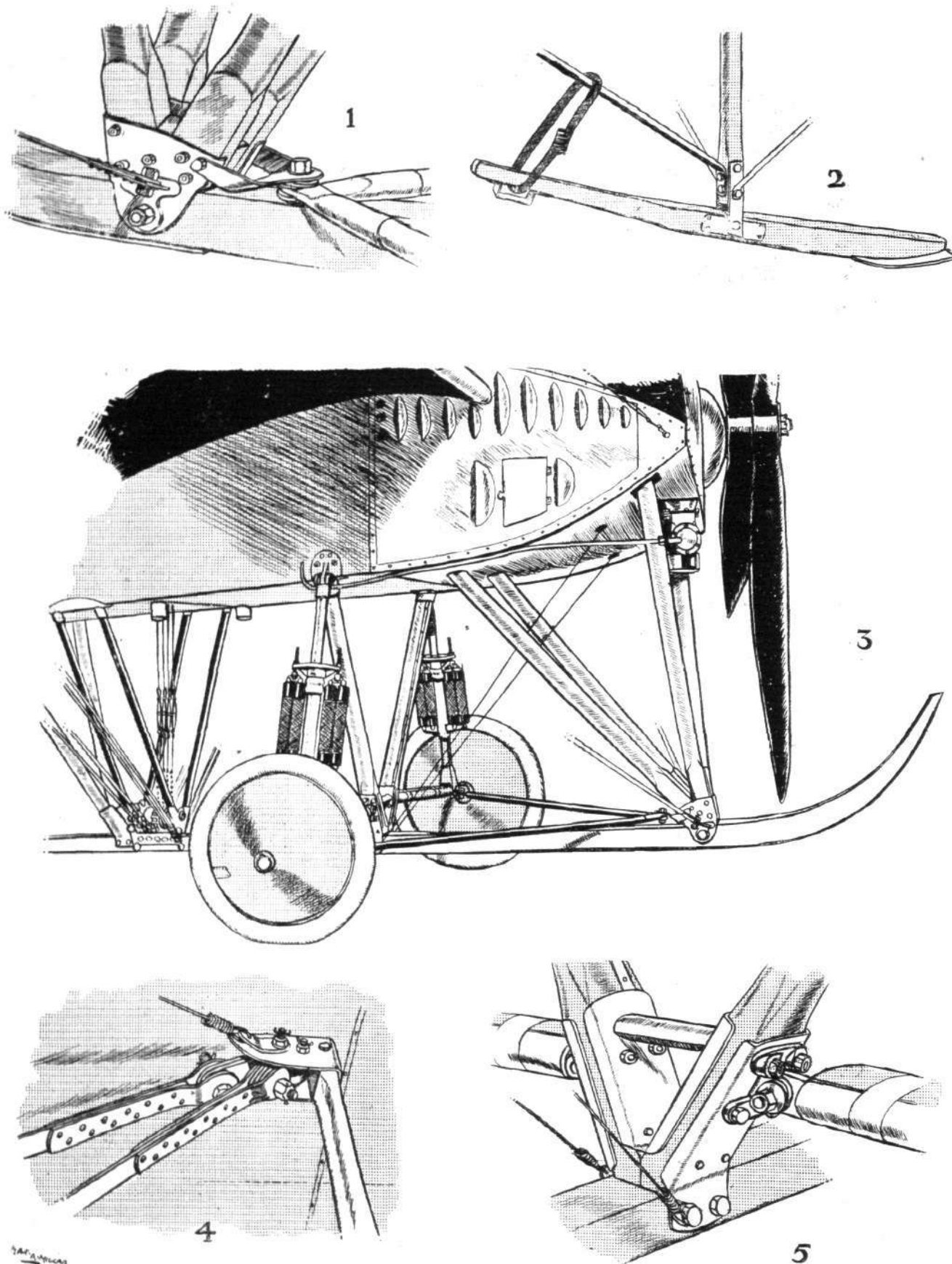
The front section of the Flanders monoplane, showing the mounting and shielding of the 70-h.p. Renault motor.



FLIGHT

The Flanders monoplane from different points of view.

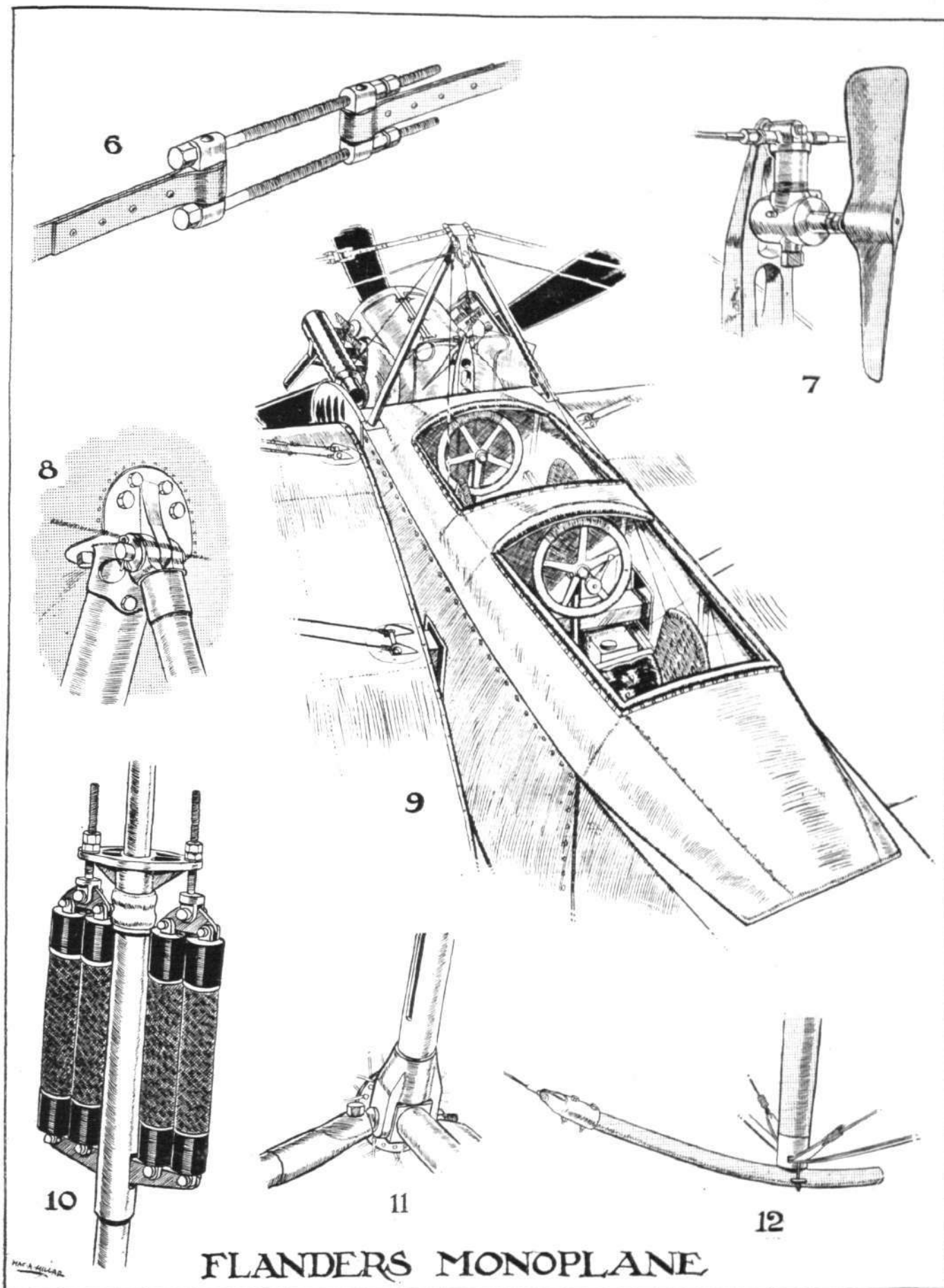
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FLANDERS MONOPLANE

DETAILS OF THE FLANDERS MONOPLANE.—1. The steel fitting for the assembly of the front two pairs of chassis struts to the skid, and the attachment of the radius-rods. 2. The light tail skid. 3. General sketch of the front of the Flanders monoplane, showing the disposition of the chassis. 4. The king-post attachment. 5. The fitting to which the axles are hinged.

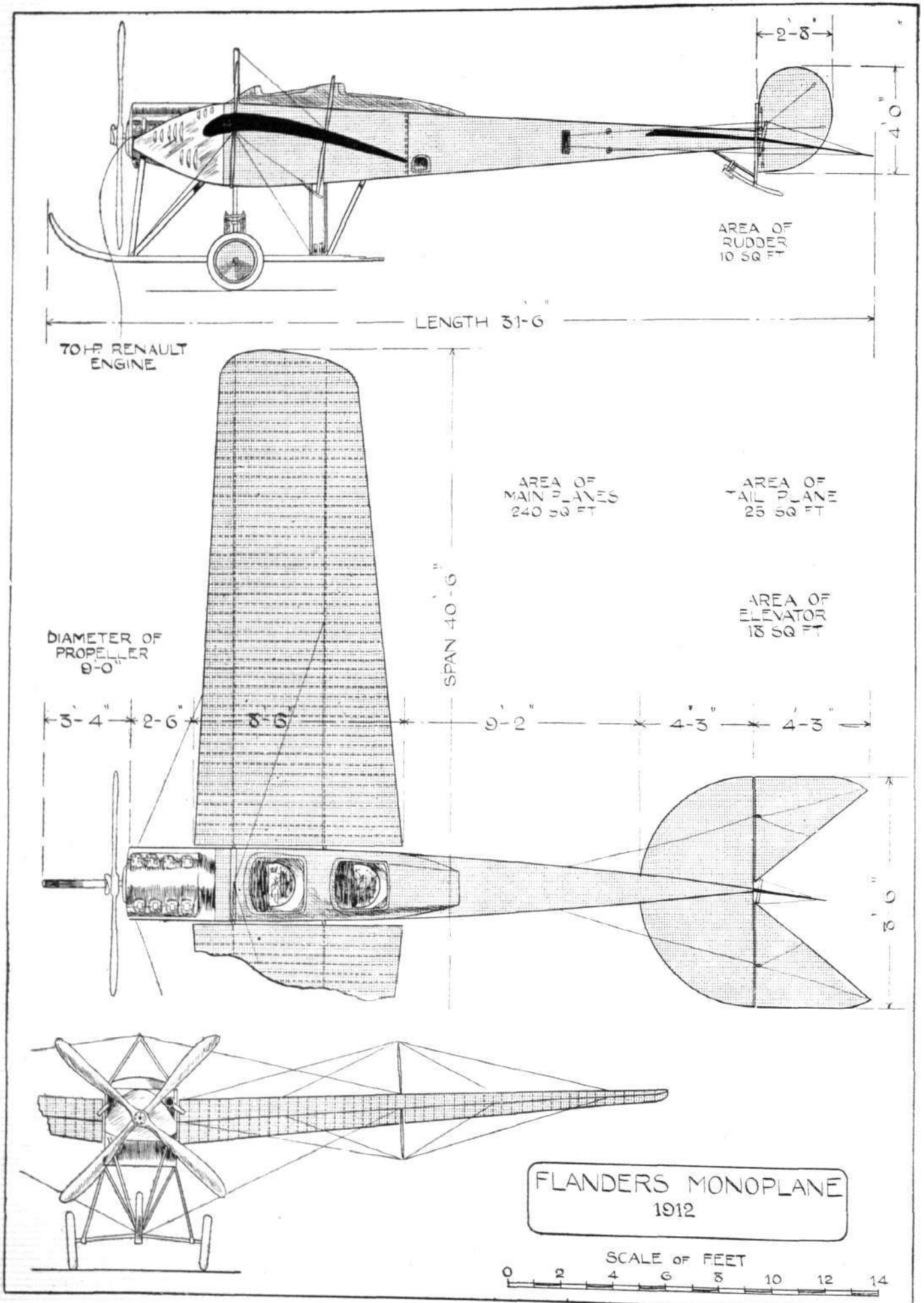
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FLANDERS MONOPLANE

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DETAILS OF THE FLANDERS MONOPLANE.—6. The Flanders steel ribbon strainer. 7. The automatic pump arranged in the slip stream of the propeller, which supplies compressed air for feeding the petrol from the main tank, low down in the fuselage, to the carburettor. 8. The fitting by which the chassis compression springs are attached to the fuselage. 9. General view from above, showing pilot and passenger's seats and double control. 10. The clever compression strut. 11. The attachment of the compression strut to the axle. 12. The neat skid that protects each rear king-post from contact with the ground.



THE FLANDERS MONOPLANE.—Plan, front, and side elevations to scale.

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and workmanlike notion of constructing his machine about a central unit distinct from the *fuselage*. To this unit the wheel-base was attached. On it the main weight of the engine, pilot, and passenger rested, and to it the wings were braced.

The changes that he has made in the landing gear have no doubt given him cause to reconsider the usual plan of making the *fuselage* serve as the unit of assembly of all parts of the machine, and not merely as a streamline shield for the occupants and as a support for the tail.

In the machine under review, the *fuselage* is considerably stronger than in the earlier Flanders machines. The *longerons* are of ash, and they are built up to form a box girder by transverse and vertical members of spruce fitting into aluminium sockets.

Each crossbracing wire in the body is tightened by an ordinary strainer. A great deal of extra strength in the *fuselage* is arrived at by applying curved strips of three-ply wood to the *longerons*. These strips are screwed on, and not only strengthen the *longerons* in the bay between

each pair of transverse struts, but render the *fuselage* much more rigid against torsion.

Regarding the wings, it is most noticeable how the thickness of the wing, the camber, and the angle of incidence diminish uniformly from the root to the tip. At the extreme tip the wing is practically flat and has no incidence. The advantages gained by this special formation, Mr. Flanders claims, are increased efficiency, increased stability, and a warp so well balanced that it renders it unnecessary to rudder when the wings are being flexed to readjust the machine's lateral balance.

From a service point of view, one of the advantages of the Flanders monoplane is its unusually large speed variation.

The second Flanders monoplane delivered to the Royal Flying Corps showed a variation of from 41 to 67 miles an hour. The advantage of being able to land and leave ground at 41 miles an hour and to maintain flight at 67 is too apparent to need any enlarging upon.



AT 7,250 FEET.

By SYDNEY PICKLES.

ONE cannot think that 7,250 ft. is a very unusual altitude in these days, when the record for height attained on an aeroplane stands at something over 17,000 ft. But, at the same time, it is plenty high enough to convey an idea as to what it feels like to explore the upper regions.

Last Monday morning I had given Mr. Ewen's 60-h.p. Caudron a little fly round by way of a test after the engine had been receiving an overhaul, and finding the machine going uncommonly well, the idea of doing a bit of climbing struck me.

For the first 1,000 ft. or so the wind—it was doing about 15 miles an hour near the ground—was rather bumpy, but higher up, although I could see by the progress my machine made it was considerably stronger, it did not worry me in the slightest, it was so beautifully steady.

It was really an ideal morning for flying, excepting that it was pretty cold, for the air was clearer than it usually is at this time of the year. I steered for a point above the "Bell" at Hendon, and then turned the machine on a course for Harrow Hill. In this direction I had the wind dead against me, and as a consequence the biplane rose so easily that by the time I was over the Hill I had climbed about 5,000 ft.

At one time I thought I should never reach the Hill, for the wind was so strong and yet so steady against me that I seemed to be hovering stationary over the aerodrome.

Here I was at 5,000 ft.! Well, I'd been up at 5,000 ft. before; better go ahead and make it 6,000 this time, I thought. So I commenced to watch the needle of the barograph. They say that a kettle never boils so slowly as when you're looking at it, and I personally can testify to the fact that, on an aeroplane, you never seem to be climbing so painfully slowly as when you're watching your barograph. At last the needle crept up to the 6,000 point, and as things seemed pretty comfortable I thought I might as well, while I was about it, keep on a bit longer, and so the machine came in time to 7,000 ft.

From that altitude, the sight of the ground below and

on all sides was really wonderful. It was for all the world like a large painted map spread out below, with dark patches here and there where clouds cast shadows on the ground. Away in the direction of London, I could see about half way across the great city, but no further, as a solid wall of grey mist and smoke rose to obscure the view. The objects that catch one's attention, looking in that direction, are the River Thames, winding in and out like a silver thread and the White City at Shepherd's Bush. Farther to the South the reservoirs at Hounslow and Staines looked for all the world like pieces of looking-glass lying flat on the ground. Beyond I could just barely discern the characteristic oval of Brooklands racing track—20 miles away. To the north it was a great deal clearer, and whereas I could just see about 20 miles in the Brooklands direction I should think I could see quite 30 miles in the opposite way.

The aerodrome below didn't seem much larger than a sheet of exercise-book paper.

The feeling of being at that height was extraordinary, to say the least of it. Above, nothing but space; on either side, nothing but space; and below, the earth—but such a long way off.

It came to me that man must, after all, be a very wonderful animal to take bits of wood, steel and cloth, and make out of them an apparatus that will lift him to such a height, with no other support than that which the air supplies in being deflected downwards by the machine's curved planes.

But I was beginning to feel rather cold, not about the body, but a tingling had begun to set up in my fingertips and in my toes. By this time I had risen another 250 ft., and as I did not particularly want to go through a previous experience I've had while flying high on a cold day, of feeling my hands beginning to get frozen stiff on the control lever, I thought it better to come down, so I cut off the motor. To rush down through the air for about a mile, the engine silent, hearing nothing but the humming of the wires and the rush of the air is a sensation that must be experienced to be appreciated properly. To my way of thinking, there is nothing more gloriously exhilarating.

THE WEMBLEY FATALITY.

AGAIN it is our painful duty to record the passing of two men prominent in the world of aviation—Lieut. Wilfred Parke, of the Royal Navy, and Mr. Arkell Hardwick, manager of Messrs. Handley Page, Ltd. They had set out on Sunday morning last on the 70-h.p. Gnome-engined Handley Page monoplane to fly from Hendon to Oxford. Reaching the Wembley Golf Course, the machine was seen to turn back in the direction of the London Aerodrome, to sway unsteadily and then drop to earth nose foremost. The ill-fated monoplane was smashed almost beyond recognition, and the pilot and passenger were found among the wreckage, dead. They must have been killed instantaneously.

As for the causes of the catastrophe, there is little doubt, in the first place, that last Sunday was an extremely treacherous day on which to fly. There was not a continuous high wind, but the air had been left from the previous day's storm in a very disturbed condition. Occasionally there would be periods when the wind was blowing with considerable force, only to be followed by practically a dead calm. Such at any rate were the conditions as observed on the ground. It may have been different up above, but as to the actual conditions in the higher levels on that day no one will ever know.

But it does not seem natural to attribute the accident solely to the unfavourable weather conditions, for Lieut. Parke was a pilot who had gained, during the 19 months since he took his *brevet*, an extremely thorough experience of flying all sorts of types of aeroplanes in all kinds of weather.

The opinion as to the cause of the accident, as expressed by one of our best known pilots, who was present at the start from Hendon, and who saw the accident happen in the distance, was that it was primarily due to the poor running of the motor.

He noticed that as the machine was leaving the aerodrome it was flying with its tail lower than it should have been. The monoplane was then something like 500 ft. from the ground, and Lieut. Parke was apparently making efforts to climb to a higher altitude. This, owing to the unsatisfactory running of the engine, he was unable to do, and on reaching Wembley and finding the machine only about 200 ft. above ground he supposed that the pilot saw the helplessness of continuing and decided to return to the aerodrome.

Turning down wind to return to Hendon, the machine seemed to take in an even more *cabré* attitude, and it was his supposition that the monoplane lost so much speed relative to the air that, being struck by a heavy gust, the pilot found his controls insufficiently operative to restore balance. A side slip resulted which gave rise to a vertical nose dive, and the monoplane crashed to earth before the pilot was successful in flattening out his downward path.

Such is one theory as to the conditions that brought about the

catastrophe. As for the official explanation of the accident, we can but await the findings of the Accidents Investigation Committee of the Royal Aero Club.

In the death of Lieut. Parke, England has lost another of her best men, and while the world of flight can spare none who volunteer for service, yet it is impossible not to feel an added sense of regret when one so eminently useful meets his end. Of one thing, at least, we may be sure, Lieut. Parke faced the enemy to the end. In flight he was fearless. No man who succeeded in coming out smiling from his terrible dive over Salisbury Plain would be likely to meet with any other experience in mid-air that would unnerve him. His unflinching cheerfulness endeared him to all, and his intense interest in the scientific aspect of aviation caused him to be of inestimable service to those engaged in trying to make flying machines safer and the art of flying more perfect.

Since he took his certificate on April 25th, 1911, on a Bristol biplane, Lieut. Parke had flown many types of aeroplanes. He had had experience of both monoplane and biplane flying, and during his flying career had flown the Sanders, Bristol, Avro, Farman, Short and Cody biplanes and Avro and Handley Page monoplanes. As a pilot, it is scarcely open to doubt that a more versatile flyer ever existed. His ability was universally acknowledged, and the present writer can testify to that as having, on several occasions, flown as a passenger with him. To his credit will always remain the distinction of being the first Britisher to fly a machine, the Avro enclosed monoplane, in which the pilot is totally enclosed by the fuselage. That in itself is no mean achievement, and illustrative of Lieut. Parke's fearless nature, for there were very few pilots who relished the idea of entering and operating an aeroplane, as one would a submarine, until Lieut. Parke had shown the way.

Mr. Arkell Hardwick had for some considerable time past acted in the capacity of manager to Messrs. Handley Page, Ltd. In his work he was very popular, for with his organizing abilities he had an unvarying good humour. He had followed a more varied career than falls to the lot of most men. He left home while he was still quite young and went to sea. On one of his voyages he was washed overboard but had the good fortune to be rescued. By a devious way, working in many parts of the world, he came back to England, not to remain long, however, for he joined the Mashonaland police, and afterwards served in the South African war.

FLIGHT readers the whole world over, we are sure, join with us in offering our heartfelt sympathies to the Rev. A. W. and Mrs. Parke, the late Lieut. Parke's father and mother, and to the late Mr. Arkell Hardwick's widow, for the sad bereavement both families have sustained.



PARLIAMENT AND AIRCRAFT.

ON Wednesday of last week, Col. Seely, the Minister of War, was subjected to a long questioning in the House of Commons, and as will be seen from the following report a good deal of information regarding the R.F.C., &c., was obtained.

Mr. Joynson-Hicks asked the Secretary for War what was the total number of biplanes, apart from school machines, in use in the military wing of the Royal Flying Corps; how many machines, biplanes, and monoplanes were on order; and how many machines had been ordered since September 30th.

Col. Seely: Fourteen biplanes are in use in the military wing, three of which are at present under repair. Sixteen machines are on order. No machines have been ordered since September 30th, but tenders for eighteen have been invited.

Mr. Joynson-Hicks further asked the Secretary of War what progress was being made in the organisation of the Royal Flying Corps as outlined by him; and whether one aeroplane squadron out of the seven promised had yet been placed upon an efficient basis.

Col. Seely: Steady progress is being made. One airship and kite squadron, three aeroplane squadrons, the Flying Depot, the headquarters military wing, and the Central Flying School have been formed, but the personnel of these units is not yet complete.

Mr. Joynson-Hicks: Does a squadron which is formed mean a squadron ready to go to war?

Col. Seely: It is a little difficult to say of a new art like flying, and a new thing like the Flying Corps, when it would be ready to take the field, but, as I say, steady progress is being made.

Mr. Joynson-Hicks: Are these squadrons on paper or are they effective?

Col. Seely: They are not squadrons on paper; they are very real, and they have made great advance.

In another reply to Mr. Joynson-Hicks, Col. Seely said that there had been 193 applications to join the Royal Flying Corps from officers and civilians. Of these 154 had been accepted, 25 were rejected, and 14 were under consideration. All the rejections were

due to the unsuitability of the applicants, and none to lack of facilities for training.

Mr. Joynson-Hicks inquired whether money was still available, without a Supplementary Estimate, to complete the development of the Royal Flying Corps and Central Flying School in accordance with the promise of the Secretary of State in April last.

Col. Seely: The reply is in the affirmative.

Mr. Joynson-Hicks wished to know whether the Clement-Bayard airship, which cost this country £18,000, still existed; if not, whether any use was being made of her engines and other equipment.

Col. Seely: The airship has been dismantled, but the parts still exist. No use has yet been made of the engines, which are, however, now being tested with a view to being used.

Mr. Lee: Can the right hon. gentleman say why no attempt was made by his Department even to give a trial to this ship after it arrived in England, and why it was allowed to remain until a portion had rotted away?

Col. Seely: It is a long time since the Clement-Bayard airship came over, and we have had to buy our experience in the matter of airships at a much less cost than other countries. I cannot go into the whole matter in a reply at question time—it is rather a long story—but I should be glad to issue a memorandum.

In reply to another question from Mr. Joynson-Hicks,

Col. Seely said: The delay in completion of the aeroplanes due from British manufacturers has not been caused by any dilatoriness on the part of the Government inspectors; but the necessity for constant inspection may have caused a portion of the delay in some cases. Further orders are being placed.

On Monday, in the House of Commons, Mr. H. Baker (Financial Secretary to the War Office), in answer to Mr. Joynson-Hicks, stated that there are no aeroplanes attached to the Army in India at present, as the proposals of the Government of India on this subject have not yet reached the Secretary of State. Meanwhile, manoeuvres in India will be conducted as heretofore.

THE PROOF.

By J. DUDLEY STURROCK.

"So you have really no explanation to give?" he asked.

His wife stood with her hand on the door-knob, and looked at him, clear-eyed, impassionate. "None. I am surprised you should think it necessary. I suppose I am very proud about—about myself. But all I can say is that it is absolutely untrue." She turned a little wearily. "By the way, we go to the Cargill's to-morrow, Jim, you remember?"

"Oh yes," he replied coldly. "Do you still wish to go over on the monoplane?"

"Of course! That was the arrangement, wasn't it?"

He looked at her, and for a moment, meeting her eyes, felt mean, immeasurably mean. But he shrugged his shoulders, and went back to the red glow of the log fire. "Very well, Molly," he said, "the machine will be ready at ten o'clock. Good night."

"Good night, Jim." She lingered a moment, and passed out quietly.

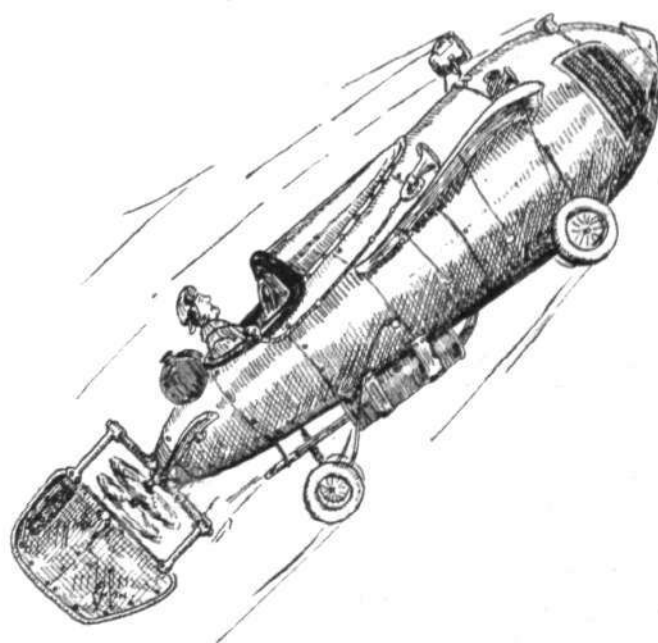
Her husband switched off the lights, and sank into his armchair by the fire. Proud about herself! he thought bitterly. He was very proud about her, too. But there was the matter of those letters, mocking at his pride from the mantelpiece. Letters that almost proved his wife to be an unmentionable woman—almost! *quite*, he argued with himself, savagely. And—the irony of it—he had stuck them up there, carelessly, under a sprig of mistletoe! What a Christmas Eve! There had been another that he remembered—the first after their near marriage—when the amazing love that his wife had brought him had swept his soul with its joyous flood and held him exulting in the goodness of her. Such things could not have been then, and yet now, after a short year, had come the thing that kills some men outright and makes an eternal wreckage of many more. He sat on brooding with red murder in his heart against the woman who had done this to him, while the fire glowed and crackled companionably at his feet.

* * * * *

The quiet countryside glistened in its royal mantle of ermine as he walked down to the lower field where his two-seater side-by-side "Weymouth" was waiting. Molly stood beside it in white sweater and woollen cap, watching the busy mechanics. He gave her a curt "Good morning," and, helping her up to her seat, climbed in beside her. "All right?" he asked, pressing the switch, "Give her a swing, then." A mechanic gave the propeller a couple of twists, and the eighty Gnome sprang to life and drowned the glad peal of bells from the little church away by the sleepy village. A couple of crows soared off cawing contemptuously. The mechanic in front of the machine was watching something about the landing chassis. Then he sprang up, and shouted. Jim switched off. "What is it?" he asked through the dying roar. "What strut? Oh, well, let her rip!" he ordered roughly, and switched on again before the propeller came to rest. He waved his hand and the straining mechanics behind let go. Over fifty yards of snow the "Weymouth" skimmed lightly like a pretty woman running with gathered skirts, and then he eased back the *cloche*. Molly pulled her woollen cap down further over her angry curls as they climbed steadily up into the biting heavens. Her husband took one look at the serene figure beside him and cursed under his frozen breath. Below he could see the villagers making their way in unaccustomed broadcloth to the little church to thank their God for another year

of placid prosperity, while he—what had he to thank Him for? He laughed aloud harshly. The best of all Christmas gifts—a tainted wife! And yet he wondered a little—wondered that, knowing all this, she had put herself in his power to-day; because she most certainly was in his power. A little movement of that vital *cloche* and she would expiate it all. He had a fleeting picture of her lying in a tangle of wreckage and blood on the snow. He winced at it involuntarily. And yet that was what he had set out to do, he admitted it unreservedly, and she deserved it—undoubtedly. No agony of her soft white body could approach that of his haggard mind. He steeled himself and looked down for a likely spot to commit his cunning murder. Two thousand feet, the recorder said. Well.

Molly touched his arm, and pointed to the left wing. It was lifting strangely. Just then a little gust struck them. The wing angled suddenly from the fuselage—quite a foot out of the level he noticed, and wondered vaguely. Something was wrong evidently, but what? In a flash, his sick brain cleared itself of its obsession and he was conscious of only one thing. Molly was in danger, and he must get her out, of course. Why the idea of *her* being— He looked down quickly through the window in the floor of the fuselage into the network of wires around the landing chassis. They seemed secure enough. But the wing lurched again, and—good God, that strut, that left-hand strut of the chassis! It was split almost to the socket to which the steel ribbons were bolted. Again a gust struck them and, fascinated, he watched the strut gape under the strain of the compression. His shaking hand pushed the *cloche* forward a little. Would there be time, he asked himself, maddened with terror—terror for his wife. . . . He put his left arm around her impulsively and his eyes fastened themselves hungrily on the



"When will it come to this?"

strut as he jockeyed the machine down at an easy angle—he did not dare to put it to the strain of a sharp descent. . . .

Suddenly the strut crumbled up, and through the window the clear-cut outlines of the chassis against the whiteness below became a hopeless tangle of wires and woodwork. For a second the left wing spar tore at the socket in the fuselage, and then with a great crash the wing flung itself upwards. He caught a glimpse of the dear white face beside him, and a spurt of blood where one of the top wires from the wing had lashed it. He gripped her hand fiercely. Then the right wing broke loose, and shut up beside him. Desperate, he pressed the engine switch, but, for some reason, unavailingly. With a maddened roar the helpless, broken thing plunged down towards the calm white earth. To right and left of them the fabric tore loose from the framework, and beat the air thunderously around them. Under the awful speed of their fall he found himself sliding helplessly on his seat. The ground below became blurred and indistinct; it was impossible to bring it into focus. And his senses were going—breathing was almost a thing of the past. . . .

He turned his head, and looked straight at his wife, and in her eyes, even in those doomed, shrieking

moments, he found his solace. The truth was there—naked, eternal. *She had not done that thing.* If they could live—if he could have the chance to tend her against the hurt he had given—If . . . But, of course, it could not be. Struggling with his own senses he felt her droop against him nearer, nearer, as the end rushed at them . . . Then at the limit of consciousness, at the last bare moment of agonised living, there was a great flash of light.

* * *
"Jim!"

He sat up in his chair with leaping heart, his breath coming in gasps. His wife stood before him, and the room was flooded with light. "Jim, I've come to explain," she said gently.

He stood up, dazed, and found his voice. "There's nothing to explain dear, I—I've had my proof." He turned to the mantelpiece and taking down the letters from it, silently, tore them into many pieces, and flung them on to the dying embers. Then he turned to meet her wondering, misty eyes. "That's all finished, Molly. Forget it—and forgive." He kissed her gently, reverently. Then "Come, I'm going to walk down to the shed and see if the old machine is all right for to-morrow!"

They went out into the starlight, hand-in-hand.

NOTES ON THE GNOME.

By EDWARD M. LING.

THE following notes may seem very elementary to men who know all about keeping engines in order, but there are a great number of others, doubtless, whose practical experience may not have been extended in this direction and to them these little details may perhaps prove of interest. To a few of the mechanics beginning practical work, they may even be of some assistance.

In any case, there is this to be said on the subject at large, namely, that men's lives depend on the mechanics' carefulness and carefulness depends very much upon the mechanics' appreciation of the little points of which I have endeavoured to mention a few. A first class man of experience gets to do all these things, and many more, without thinking about them. They become second nature, like the putting on of one's clothes in the morning. It is just for this reason that some of these details that are of distinct importance are seldom talked about.

On completing a run, a Gnome engine should be well washed out with paraffin, injected through the cylinder head by means of a syringe. When every cylinder has been so treated, the engine should be turned rapidly for a minute or two, and on coming to rest, care should be taken to see that the exhaust valve of the bottom cylinder is left open. This prevents the lubricating oil from accumulating in the cylinder.

If the engine is to be left standing for any length of time owing to bad weather or other causes, it is advisable to give the engine one or two turns daily, and make sure that a different cylinder comes in position at the bottom. Should this be neglected the exhaust valve springs become weak through remaining depressed in one position too long.

When running a Gnome engine, care should be taken not to exceed the number of revolutions stipulated by the makers, which is somewhere about 1,100 r.p.m. A higher engine speed can be attained by extreme spark advance and setting of valves to suit, but the extra wear and tear is serious.

Much labour in overhauling is avoided by careful adjustment of the mixture drawn in from the carburettor. The petrol supply should be so regulated that an even firing mixture is supplied to the engine, and as much air as is consistent with maximum efficiency should be taken in. A longer time can therefore be allowed before it becomes necessary to take the engine down for cleaning.

The lubricating oil should be strained before passing into the oil tank and the pump supply so adjusted that the delivery of oil to the moving parts is not excessive but just sufficient to keep the bearings and cylinder walls well lubricated. An excess of oil means trouble through carbonisation rapidly taking place, and misfiring often occurs by reason of the plug points becoming sooted up.

The oil enters the crank-case with the mixture, and becomes atomised by the churning action of the connecting rods. Consequently, the finely atomised oil passes through the inlet valve to the

top side of the piston, and some of it is burnt and deposited as carbon on the walls of the combustion chamber. The greater the amount of oil supplied to the engine, the heavier and more rapid the deposit of carbon.

Particular attention should be paid to the sparking plugs, which must be examined frequently, and the platinum points kept clean, and set to the proper gauge for ensuring the right spark gap. The distributor disc on the engine must be inspected occasionally and kept free from dirt and oil. The brass contact segments should be refaced at intervals by carefully rubbing the distributor, face down, on a sheet of plate glass or other suitable surface, with the finest emery flour and oil. Also make sure that the carbon pencil or brush is held in close contact with the face of the distributor, and makes a perfect contact with the same.

There is a peculiarity about the exhaust valves on Gnome engines that should be watched. The bridge piece that carries the guide for the valve stem is thicker in proportion to the surrounding metal of the detachable head and, when heated, has a different rate of expansion. Owing to this, the valve seating becomes warped, when the heated head contracts on cooling, and causes the seating to assume a slightly oval shape. Careful re-grinding is then necessary, and in some cases the valve seat must be trued up in a lathe to restore it to an accurate fit.

Excessive wear also takes place with the bottom spring of the set operating the exhaust valve and needs frequent attention. When renewing these springs, do not fit a complete new set to one cylinder and neglect the others. The best method is to remove all the bottom springs at the same time when they show signs of wear, which ensures all the exhaust springs being more nearly of the same strength in actual use.

Sometimes, when an engine gets hot, explosions take place after the magneto has been "cut out" by switching off. This is a sure sign of excessive carbonisation and is due to small particles of carbon becoming incandescent by the heat of the explosions, and remaining so a sufficient time to automatically ignite the fresh charges drawn in from the carburettor. When this takes place the engine should be taken down and thoroughly overhauled.

An Aluminium Calendar.

ONCE again we have to thank Mr. Robert W. Coan for his annual reminder of this season of good will. This year it takes the form of a perpetual calendar, on the front of which is cast an old English scene "The Squire's Xmas Box." Although it is perhaps not quite so utilitarian as the charming fruit dishes with which Mr. Coan used to favour his friends, it is an excellent example of the remarkable casting in aluminium turned out at the works at 219, Goswell Road, E.C.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

The Late Lieut. Wilfred Parke, R.N.

THE news of the sad accident at Wembley Park on Sunday last, resulting in the loss of Lieut. W. Parke, R.N., and Mr. A. Hardwick, was received at the Club with great sorrow. Lieut. Wilfred Parke, R.N., was a regular visitor at the Club when in town and will be much missed by the Members, with whom he was a great favourite. The Chairman, Sir Charles Rose, immediately forwarded messages of sympathy on behalf of the Members of the Club to the relatives of Lieut. Parke and Mr. Hardwick.

Committee Meeting.

A MEETING of the Committee was held on Tuesday, the 17th inst., when there were present: Mr. R. W. Wallace, K.C., in the Chair, Mr. Griffith Brewer, Mr. G. B. Cockburn, Capt. J. D. B. Fulton, R.F.A., Mr. F. K. McClean, Mr. Alec Ogilvie, Mr. C. F. Pollock, and the Secretary.

New Members.—The following new members were elected: A. C. G. Brown, J. F. Fielding, A. W. Furbank, Bernard Hemmons, L. F. Nolan, and Walter Wood.

Aviators' Certificates.—The following Aviators' Certificates were granted:—

370. Midshipman Noel F. Wheeler, R.N. (Bristol Biplane, Bristol School, Salisbury Plain).
371. Pierre Gratien (French Subject) (Blériot Monoplane, Blériot School, Hendon).
372. Joseph Claude Andrews (Petty Officer, R.N.) (Avro Biplane, Central Flying School, Upavon).
373. Capt. John Nowell Stanhope Stott (5th Dragoon Guards) (Vickers Monoplane, Vickers School, Brooklands).
374. Robert W. Edwards (Shipwright, R.N.) (Short Biplane, Royal Naval Aviation School, Eastchurch).
375. 2nd Lieut. William C. K. Birch (Yorkshire Regiment) (Grahame-White Biplane, Grahame-White School, Hendon).
376. Vincent P. Taylor (Bristol Biplane, Bristol School, Salisbury Plain).
377. Lieut. Reginald Mills (Royal Fusiliers) (Bristol Biplane, Bristol School, Brooklands).
378. Lieut. Edward R. L. Corballis (Royal Dublin Fusiliers) (Vickers Biplane, Vickers School, Brooklands).
379. Lieut. Robert Valentine Pollok (15th Hussars) (Vickers Biplane, Vickers School, Brooklands).
380. Frank Susans (Engine Room Artificer, R.N.) (Short Biplane, Royal Naval Aviation School, Eastchurch).
381. George Prickett (Leading Seaman, R.N.) (Short Biplane, Central Flying School, Upavon).
382. Sub-Lieut. G. W. W. Hooper, R.N. (Deperdussin Monoplane, Deperdussin School, Hendon).

Letter from the Aero Club de France, requesting the Club to give its sanction to the issuing of an Aviator's Certificate to Mr. Clive Mellor, was considered, and the necessary permission granted.

Flight Over London.—Mr. B. J. Manio attended before the Committee and explained the circumstances under which he came to be flying over the City of London on December 5th, contrary to the Club regulations, and as to his subsequent descent on a house at Palmer's Green. The Committee, after considering all the circumstances of the case and his assurance that he had no intention of infringing the regulations of the Club, unanimously decided that his certificate be suspended in the United Kingdom until March 31st, 1913.

Suspensions by the F.A.I.—Letter from the Fédération Aéronautique Internationale of November 29th, 1912, notifying suspensions of Mr. Lincoln Beachey and Mr. Farnum T. Fish, until July 1st, 1913, pronounced by the Aero Club of America, was received.

Re-elections.—On the motion of Mr. G. Brewer it was resolved, "That those Members elected between November 1st, 1911, and October 31st, 1912, be re-elected under Rule 27 with one exception."

Public Safety and Accidents Investigation Committee.—On the motion of Mr. G. B. Cockburn, the following report of the Public Safety and Accidents Investigation Committee was unanimously adopted:—

Meetings were held on October 22nd, November 25th and December 3rd, 1912, when there were present: Col. H. C. L. Holden, C.B., F.R.S., in the Chair, Mr. A. E. Berriman,

Mr. G. B. Cockburn, Mr. J. H. Ledebour, Mr. F. K. McClean, Mr. W. O. Manning, Mr. A. Ogilvie, Mr. M. O'Gorman, Maj.-Gen. R. M. Ruck, C.B., R.E., and the Secretary.

REPORT ON THE FATAL ACCIDENT TO MR. HENRY J. DELAVAL ASTLEY AT BELFAST, ON SATURDAY, SEPTEMBER 21ST, 1912, AT ABOUT 3.55 P.M.

Brief Description of the Accident.—Mr. Henry J. Delaval Astley, flying on a Blériot monoplane fitted with a 70-h.p. Gnome, at the Balmoral Grounds, Belfast, on Saturday, September 21st, 1912, was giving exhibition flights. Mr. Astley had been in the air for about 4 minutes and during that time had made one or more exceedingly sharp turns. He entered the flying ground at a height of about 70 feet and passed in front of the grand stand at about 30 feet from the railings. When about 80 yards farther on, and about 45 yards from the end of the enclosure, having then come down to about 40 feet from the ground, Mr. Astley made an exceedingly sharp left-hand turn, banking very steeply, apparently intending to keep inside the flying ground. He had turned through a semicircle and then found himself heading for the spectators; immediately afterwards, the aircraft struck the ground on the left wing, just inside the railing, on the other side of which were spectators. Mr. Astley was killed practically instantaneously, his head having been thrown forward against one strut of the cabane.

Mr. Henry J. Delaval Astley was an experienced aviator, having made a large number of flights both in Great Britain and abroad.

He was granted his Aviator's Certificate No. 48 on January 24th, 1911.

Report.—The Committee sat on Monday, October 25th, and Tuesday, December 3rd, 1912, and heard the evidence of eye-witnesses.

Opinion.—The Committee is of opinion that the accident was entirely due to an attempt to make a very sharp turn at too low an altitude. At the last moment, the aviator made this attempt in order to avoid the spectators.

Recommendation.—The Committee is of opinion that the ground in question was unsuitable for the sort of exhibition flights which Mr. Astley was attempting. It was too narrow for an aviator to attempt sharp turns at a low altitude and between spectators on either side of the ground. The inevitable danger from this condition of affairs should be made known to promoters and aviators.

Annual Dinner.—The following Sub-Committee was appointed to make the arrangements for the Annual Dinner to be held in February next: Mr. E. C. Bucknall, Mr. Martin Dale, and Mr. R. W. Wallace, K.C.

British Empire Michelin Competition No. 1.—The conditions for the Competition for 1913, suggested by the Competitions Committee, were approved and ordered to be submitted to the Michelin Tyre Co., Ltd.

Competitions Committee.

A meeting of the Competitions Committee was held on Thursday, the 12th inst., when there were present: Col. H. C. L. Holden, C.B., F.R.S., in the Chair, Mr. F. P. Armstrong, Mr. Ernest C. Bucknall, Mr. G. B. Cockburn, Major F. Lindsay Lloyd, Mr. J. T. C. Moore-Brabazon, Mr. N. C. Neill, Mr. Alec Ogilvie, Mr. E. V. Sassoon, and the Secretary.

British Empire Michelin Competition No. 1.—The conditions for the competition for 1913 were drafted and ordered to be sent to the Executive Committee.

Certified Trials.—The application from the Blair Atholl Aeroplane Syndicate, Ltd., for a certified trial of the "Dunne" biplane was considered and the necessary arrangements for the carrying out of the trial were approved.

Insurance Committee.

The Insurance Sub-Committee met on Thursday, the 12th inst., Mr. C. Braun in the Chair, Mr. F. E. Bray, Mr. Martin Dale, Mr. K. H. Marshall, Mr. C. F. Pollock, and the Secretary.

The statistics of aviation insurance from April 1st, 1912, to date were considered.

Arbitrations.

The Arbitration Committee appointed by the Royal Aero Club, sat on December 5th, 1912, and heard the case of *Aeros, Limited, v. The Committee of the Glamorgan National Reserve Military Tournament*. The arbitrators were:—Mr. Roger W. Wallace, K.C., in the Chair, Mr. E. C. Bucknall, and Mr. G. B. Cockburn.

Aeros, Ltd., claimed a balance of £60 in connection with an exhibition of flight made at Caerphilly on August 31st, 1912, by the late Mr. H. J. D. Astley. Aeros, Ltd., were represented by Messrs. Church, Rendell, Bird and Co., of London, and the Glamorgan National Sports Committee by Messrs. Gilling and Goodfellow, of Cardiff.

The arbitrators awarded that Aeros, Ltd., should be paid £40 and that each side should bear their own costs and that the costs of the award should be paid by the Committee of the Glamorgan National Reserve Military Tournament.

The Arbitration Committee also sat on December 13th, 1912, and heard the case of Aeros, Ltd., v. The Committee of the Drayton Manor Sports. The arbitrators were: Mr. Roger W. Wallace, K.C., in the Chair, Mr. E. C. Bucknall, Mr. G. B. Cockburn, and Mr. J. T. C. Moore-Brabazon. Aeros, Ltd., claimed a balance of £50 in connection with an exhibition of flight made at Drayton Manor Park on August 5th, 1912, by Mr. N. S. Percival. Aeros, Ltd., were represented by Messrs. Church, Rendell, Bird and Co., of London, and the Drayton Manor Sports Committee by Messrs. Richardson, Sowerby, Holden and Co., of London.

The arbitrators awarded that Aeros, Ltd., should be paid £10, and that each side should bear their own costs and half the costs of the award.

Wembley Accident.

Representatives of the Accidents Committee of the Royal Aero Club attended at Wembley on Sunday and Monday and carefully examined the wrecked aeroplane. The inquiry into the accident commenced on Friday, the 20th inst., at the Royal Aero Club.

Prize for Hydro-Aeroplanes.

The Aero Club de France has notified the Royal Aero Club that Mr. Jacques Schneider will present an International Prize for hydro-aeroplanes of the same nature as the Gordon-Bennett Prizes. The regulations for this prize will be discussed at the January Conference of the Fédération, at which the Royal Aero Club will be represented.

Presentation to Library.

Monsieur Maurice Gandillot has very kindly presented to the Club Library a copy of his book, "L'Hélice et la Résistance de l'Air."

Presentation of Lantern Slides.

Mr. Howard T. Wright has very kindly presented to the Club six lantern slides depicting the Eiffel Curves.

166, Piccadilly.

HAROLD E. PERRIN, Secretary.

FROM THE BRITISH FLYING GROUNDS.

Brooklands Aerodrome.

OWING to the high wind last Saturday there was no flying at all, and the Altitude Competition had therefore to be postponed.

On Sunday the few spectators present warmly applauded several excellent circuits made by Mr. Petre on the latest Martin-Handasyde monoplane at a height of 500 ft. in a wind registering up to 35 miles an hour. The engine was running splendidly, and the steadiness of the machine in such a high wind was much admired. Mr. Merriam also went up on the Bristol biplane afterwards, but did not stay up long owing to the treacherous nature of the wind. The Quick-Starting and Alighting Competition had to be postponed.

Bristol School.—Wind was too strong on Monday morning last week for any flights. Bendall made a trial in the afternoon, but conditions too bad for school work.

On Tuesday, Bendall was first up, followed by Merriam, who then ascended as passenger with Capt. Powell, Bendall taking Lieut. Thompson. Merriam then up behind latter pupil on straights; Lieut. Todd and Messrs. Ewing and Featherstone were all out for circuits, completing several right-hand turns. Merriam went out as passenger to Capt. Powell, giving pupil landing practice. Heavy rain prevented any flying after breakfast.

Rain and wind baffled attempts at school work all Wednesday.

On Thursday, Bendall was up for two solos; no pupils turned up till after breakfast. Bendall out for another solo, then Mr. Featherstone out for a couple of circuits, and Merriam up with Capt. Rickard, whilst Bendall also took this same pupil and Mr. Lane. Mr. Featherstone made two circuits, but rising wind stopped further work. Merriam tested in the afternoon, afterwards giving a trip to a prospective pupil. Lieut. Thompson was out for tuition, but gusty wind made it advisable to stop flying.

Ducrocq School.—Monday, last week, Mr. J. Alcock making circuits and cross-country trips, also testing Mr. Parson's Sommer. Next day he was out for his usual cross-country flight over Weybridge and Chertsey, landing with a long glide from 1,000 ft., also flying circuits with passenger.

Thursday another fine cross-country flight round Weybridge, Walton and Chertsey, finishing with a long glide from 1,300 ft. McAndrew put in circuits and right-hand turns. Alcock was making circuits and passenger flights in a gusty wind, and also testing Mr. Parson's Sommer biplane fitted with his automatic stability device.

Monday Alcock was flying circuits with new Bristol propeller, and McAndrew was making figure eights and circuits.

Circuits again Tuesday in gusty wind throughout evening by Alcock; too windy for pupils.

Howard-Flanders School.—Raynham was out Sunday last testing new military monoplane for about 20 mins. in the morning. Weather impossible during the afternoon. On Monday, Raynham flew the military monoplane at about 2,000 ft. for half an hour just before dusk, landing almost in darkness in his usual fine style. Next day he made flight very similar to Monday's, just about dusk, for about half an hour. It is hoped this machine will now be delivered to the Royal Flying Corps in the course of a day or two.

Vickers School.—Barnwell doing straights on Farman Monday last week with Capt. Salmon in back seat. In the afternoon the wind stopped biplane work, and Barnwell made a flight in No. 5 monoplane, finding himself very near the roof at only 1,200 ft.

Tuesday Major Cameron and Capt. Salmon with Barnwell, and later Knight up behind, put in a large number of straights each,

making very good flights and landings. Later on the rain stopped flying. Too windy for pupil work Wednesday and Thursday. Knight made test flights on Farman, then sat behind Capt. Salmon, who is getting on very well indeed, for a number of straights. Later on Knight took up Mr. Lane in back seat, followed by Capt. Salmon in front seat. In the afternoon Mr. Lane was promoted to front seat, and got on very well indeed.

Friday, Saturday and Sunday windy all day, and no flying. London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Owing to the wet and windy weather prevailing practically the whole of last week, very little work was done in the school. On Thursday, December 12th, Capt. Kunhardt was making straight flights on the Grahame-White biplane No. 5.

Lieut. R. G. D. Small out with Instructor Manton at 9.15 a.m. on No. 5, the same instructor afterwards taking up Capt. Kunhardt as passenger. During the week some exhibition flights were got in.

Mr. Louis Noel was on a 80-h.p. Farman at 4.5 Monday with passenger, and on Thursday, which was a particularly favoured day as regards weather, a number of spectators were present to witness a splendid afternoon's flying. At 3 o'clock Mr. Louis Noel was up with a lady passenger on the 80-h.p. Farman, afterwards giving several exhibition flights, including circuits and cross country. Mr. Manton was flying the No. 5 Grahame-White biplane, Mr. Marcel Desoutter the Blériot monoplane, and rising to a good altitude; Mr. Sydney Pickles on the Caudron biplane, and Lieut. Porte on the Deperdussin monoplane; Mr. Lewis Turner also flying the Caudron.

Blackburn School.—Tuesday last week, in the morning, Mr. H. Blackburn took the *brevet* machine for a test flight of about 10 mins., afterwards giving Mr. Buss tuition in landings for 30 mins. In the afternoon, Messrs. Glew and Laurence Spink practised straight flights for 20 mins. each.

Mr. Buss practised straight flights for 20 mins. on Thursday, afterwards Messrs. Glew and Spink 20 mins. each, and Mr. Buss another 10 mins.—all this in the morning. In the evening, Messrs. Glew and Spink practised straight flights for 10 mins. each. All show promise of quitting this stage very shortly.

Sunday morning, a test flight by Mr. Blackburn of 15 mins., followed by Mr. Buss, 20 mins., spent in straight flights.

Blériot School.—Monday last week was wet and windy, and no school work was possible, but on the following day Lieut. Loftus Bryan was out on L.B. 1 doing straight flights, but his practice was early interrupted by rain, which continued almost incessantly during the remainder of the day.

Thursday was the only other day during the week suitable for pupils and then Lieut. Loftus Bryan and Mr. R. Desoutter were out on No. 1 both doing short straight flights and hops. Lieut. Eric Conran was practising on L.B. 3 for his superior *brevet* and owing to the wind confined himself to straights as did also Messrs. Sacchi and Gandillon. Lieut. Conran did very well, this being the first time he has tried a comparatively fast Blériot and should make a really fine monoplane pilot with more practice.

On Friday Mr. Bertram W. Williams joined the school as a pupil, but the day was too windy for practice.

Deperdussin School.—On Monday, last week, during the fine spell, Capt. Macdonald put in some practice on No. 3 machine, making good straight flights and landings. Mr. Scott also put in some straights on No. 3 machine. Mr. Brock and Instructor Brereton also out on No. 3 and No. 4 machines.

Conditions not favourable for school work Tuesday.

Thursday. Weather conditions in the morning were very favourable, pupils putting in some very good practice. Lieut. Hooper went for his *brevet*, which he secured in excellent style, his figures of eight and landings being very good. Mr. Scott was on *brevet* No. 3, making straight flights and circuits, landing very neatly. Mr. Valazzi was also putting in good work on No. 2 and No. 3 machines, and making excellent progress. Mr. Whitehouse put in some very good straights on *brevet* No. 4, his landings also being good. Mr. Spratt, Mr. Brock and school instructor Breton were also out on No. 3 and No. 4 machines doing circuits. In the afternoon, Lieut. Porte was out for some time on the 100-h.p. Anzani 2-seater. He reached a good height, the engine pulling well, and after a splendid flight finished with a fine *vol plané*.

Weather very stormy Friday and Saturday, no school practice.

Sunday morning being very fine Mr. Phelps and Mr. Valazzi got in some good practice on No. 2 machine, both pupils showing marked improvement.

Lieut. Mapplebeck and Mr. Whitehouse were out Monday on No. 4 *brevet* machine doing several circuits in good style, and making excellent landings. Mons. Deroye also put in one circuit on the same machine flying it very well.

W. H. Ewen School.—School work last week was again set back by continued unfavourable weather conditions. On Tuesday, however, the pupils were out at 11.30 a.m. under the instruction of M. Baumann, who, taking advantage of the first opportunity, had Messrs. M. Zubiaga and R. S. McGregor doing straights, and making excellent progress on monoplane No. 1.

On Thursday a good morning's work was put in. Mr. Lewis Turner had out the 35-h.p. Caudron, and after a good exhibition flight lasting 20 mins., in which he reached an altitude of 1,000 ft., finished with a spiral *vol plané*. He then handed the machine over to Mr. L. Russell who made several good straight flights and half circuits, handling the machine confidently and making nice landings. Lieut. M. W. Noel also made several straights on the same machine.

M. Baumann was also busy with pupils on the 28-h.p. Caudron. Lieut. M. W. Noel and Mr. H. Gist making excellent straight flights in good style. To finish a good morning's work Mr. Lewis Turner again went up on the 35-h.p. Caudron in a rapidly rising wind.

Salisbury Plain.

Bristol School.—On Monday last week Busteed was testing a machine in a strong wind, which was too bad for school work.

Harrison was first up on Tuesday taking Lieut. Vernon and Lieut. Marix for biplane tuition, and making a test of tandem machine. England was out for a solo, after which he gave tuition to Mr. Tower, Lieuts. Bigsworth, Rees and Littleton. Lieut. Negrescu was out for one solo in a tandem monoplane, but weather too bad for other pupils' solos. Busteed was testing a new type, this being all the work done. Rain was falling when England set out to give tuition to Lieuts. Vernon, Bigsworth, and Marix. Harrison was busily occupied taking up Lieuts. Vernon, Littleton, Rees, and Marix. Weather was too bad for pupils' solos, and darkness put an end to further work.

On Wednesday very high wind, and rain, no flying all day.

England made a trial first in biplane, and then in monoplane, on Thursday morning, afterwards giving two flights to each of the following pupils in biplanes: Lieuts. Bigsworth, Vernon, Marix, and Littleton. Fullerot was also up giving two trips to each of the following: Major Merrick, Lieuts. Bowhill, Bigsworth, Marix, and Littleton. All of these pupils were taken for two further tuition trips by Pizey. Busteed was up for a test flight of the 80-h.p. Bristol, belonging to Prince Cantacuzene. Lieut. Negrescu, one of the Roumanian officers, then set out, and successfully passed the tests for his certificate, making an exceedingly fine flight. Lieuts. Chiscaneanu and Parvelescu both made solos in tandem monoplanes, but rising wind prevented further work.

Royal Flying Corps.—On Monday of last week Capt. Fox on biplane 203, also Capt. Dawes on the Maurice Farman biplane 216, in a 30-mile wind. The very treacherous winds on Tuesday and Wednesday, however, prevented outdoor work.

Thursday brought a change, and Capt. Dawes started with a flight on the Maurice Farman biplane 216. Lieut. Wadham took the biplane over to the Central Flying School at Upavon in order to pass an examination. He returned later to Lark Hill at a height of 800 ft. in treacherous winds. Capt. Dawes intended flying to Farnborough, but the weather was too rough. Mr. Percival brought out the Dunne biplane and was flying for 30 mins. round Knighton Downs and Netheravon at a height of 1,000 ft., doing some sharp turns. He was out again on Sunday, and did half-an-hour's flying in a stiff wind.

Capt. Dawes was out on Monday on the Maurice Farman biplane, 216, scouting around the Plains, and Mr. Percival took Major Brooke-Popham for a trip on the Dunne biplane. Mr.

Percival was again out in the afternoon, taking up Lieut. Rees, R.G.A., a pupil of the Bristol School, for a flight around Shrewton at a height of 800 ft.

Tuesday morning was frosty, but Mr. Percival was out on the Dunne biplane again, with Major Brooke-Popham as passenger, for a 25-min. flight. Capt. Dawes followed later on Maurice Farman biplane 214 for a 10-min. flight, but the treacherous winds and rain curtailed flying. The Royal Flying Corps are taking over the Netheravon Cavalry School for temporary quarters until February.

Shoreham-by-Sea.

Avro School.—On Thursday last week Simms had out the Green-engined Avro, which has been rebuilt, he being very pleased and pronounced the machine greatly improved. Pupils rolling. Powell had out Barga monoplane for further tests.

Upavon (Central Flying School).

To bring both services, the Army and Navy, in close touch with each other is a step in the right direction. The institution of the Flying School has already been the means of accomplishing this to a great extent, and the Army and Navy work in daily touch together at Upavon, with the result that they are sure to recognise and fully appreciate each other's value. Great strides have also been made in ascertaining the limitations of aircraft, and it is to be hoped that next year the artillery will be able to carry out firing experiments at objects in mid-air on Salisbury Plain. The existing local county council's by-laws handicap work of this kind, as firing can only take place during certain hours of the day. At present firing cannot commence until nine o'clock in the morning, and as the most suitable time for flying during the summer months is obviously in the early morning just after dawn, it is to be hoped that arrangements can be come to which will enable artillery practice, at the same time, it being highly essential for aeroplanes to work in conjunction with artillery in action. Should night flying become more general, and the work of this kind done at Hendon lately certainly lead one to form the opinion that it will, valuable experiments in repelling night attacks by aeroplanes could also be carried out. It would be highly interesting, from a military standpoint, to ascertain whether artillery working in conjunction with powerful searchlights would be really effective in repulsing aircraft under such difficult conditions. Long distance cross-country flights should be encouraged; and, indeed, several military officers have lately done some fine work of this kind in anything but ideal weather.

Monday last week at the Central Flying School opened with a strong southerly wind, the weather afterwards coming on dull and somewhat misty. Lieut. Longmore was out on the Maurice Farman 411 for 10 mins. or so, and Major Ashmore was up on the Maurice Farman 418 for about the same length of time. Capt. Salmond also brought the BE machine 417 over from Farnborough under somewhat trying weather conditions.

During Tuesday, moderate southerly winds prevailed, but heavy rain stopped all flying after 10 a.m. On the Short biplane 401, Major Gerrard took Capt. Lithgow, R.A.M.C., up for 10 mins. or so, and Leading Seaman Prickett was on the same machine for about a quarter of an hour. Lieut. Longmore was on the Maurice Farman 411 for a short trip of 10 mins., afterwards taking Petty Officer Andrews up for a few minutes.

Wednesday was a failure as far as flying was concerned. The wind was still in the south, only much stronger than the previous day, and heavy rainstorms were frequent.

Thursday was fine and clear, the wind having veered to the south-west and decreased considerably. Leading Seaman Prickett went out with Major Gerrard to the practice ground in order to qualify for his pilot's certificate. He accomplished the first half of his *brevet* in 12 mins., afterwards doing his second half in about 17 mins. at an average height of about 500 ft. Major Gerrard then went out with Capt. Lithgow, R.A.M.C., for quarter of an hour or so. Petty Officer Andrews, who was also successful in obtaining his *brevet* some few weeks ago, made a good 30-mins. flight on the Maurice Farman 403. Lieut. Atkinson also was away for over 30 mins. on the same machine.

On the Maurice Farman 411 Lieut. Longmore, R.N., took Leading Seaman Bateman out for a couple of fairly long turns of 48 mins. and 25 mins. respectively, afterwards returning and taking up Paymaster Lidderdale, R.N., for a spin of 20 mins. duration. Lieut. Pepper was away a full hour on the Maurice Farman 415 and Lieut. Allen made a short trip of about 12 mins. Engineer Lieut. Randall, R.N., then took over the same machine for about quarter of an hour. Capt. Webb Bowen left the school on BE 206 for Farnborough, and made a fast trip, being only 42 mins. *en route*. Major Ashmore was away an hour and a half on the Maurice Farman 418 over Stockbridge way, doing a fine performance.

On Friday the wind had increased to such an extent as to make flying out of the question, and Saturday was no better—worse, in fact, as it rained also during the day.

EDDIES.

THINGS are moving along at a fairly rapid pace at Messrs. A. V. Roe and Co.'s works in Manchester. Next week will see the dispatch to Eastchurch of a 100-h.p. Gnome-engined hydro-biplane that has been constructed to an Admiralty order. There, it will be tested on behalf of the firm by Mr. Stanley Adams. As usual with Avro productions, there are many interesting points about the machine, especially as regards the under-carriage which is adapted for alighting on and rising from, either water or land. It has one main float, a stepped one of Gnosspelius design, but the combination of wheels and floats is essentially an Avro invention, the subject of a patent that is at the present time being applied for. All on, with pilot, passenger—the machine is a two-seater—and enough petrol and oil for a six hours' flight aboard, the machine is expected to weigh something in the neighbourhood of 2,500 lbs.

In addition, four more Avro biplanes with 50-h.p. Gnome engines, the same as those already supplied to them, have been ordered by the War Office. That it is purely a repeat order is sufficient to indicate that the biplanes previously supplied have given every satisfaction in use.

If anyone ever did deserve success it is Mr. A. V. Roe, for he was one of the earliest pioneers of the aeroplane movement in England, and throughout the period during which aeroplanes have been arriving at their present-day state of advancement, he has stuck to his guns and persevered in face of many disheartening reverses. As may be remembered, Mr. Roe's early experiments in flying were carried out at Brooklands during the end of 1907 and the beginning of 1908, but the flying ground as it is now was non-existent then, and the hops that he managed to accomplish then were done along the finishing straight of the track. His shed, in those days, was not big enough to house the machine completely erected. It had to be taken out in bits, and two hours of solid hard work had to be gone through before the machine was ready for experimenting with. The same process had to be gone through in getting the biplane back under cover, when the tests were finished for the day. Mr. Roe had no assistance whatsoever in building the machine, or in experimenting with it. How many men would have been content to continue working under such trying conditions?

Another machine, a triplane, was then evolved and taken to Lea Marshes. But there was trouble there with the authorities, for when the grass was long he was ordered off for depreciating the value of somebody's grazing rights, and when the grass was short he was ordered off just the same, but for the reason that he was causing an obstruction on public property. Later on he took up his quarters at Wembley, where the same sort of thing occurred. His presence there was not deemed desirable for the fact that he had had the misfortune to smash up his machine in the middle of the much revered cricket ground with somewhat disastrous effects to the quality of the pitch.

And so misfortunes went on for some while. However, it is gratifying to hear that a private limited company of

£30,000 capital has been formed to absorb Messrs. A. V. Roe and Co.'s business, as from the first day of the New Year. With the pressure of business they have had during the past year, they have had to extend their works on several occasions. Their enlarged capital will enable the firm to set out constructing on a much larger scale, and doubtless they will lay themselves out for foreign business to a greater extent than they have up to the present. Mr. A. V. Roe and his company have, I am sure, the sincerest wishes for success of all FLIGHT readers.

Undoubtedly one of the most notable flights of the year was that undertaken by Verrier, with Lieut. Mapplebeck as passenger, on a Maurice Farman biplane from Hendon to Brooklands, on Wednesday of last week. The wind throughout the trip was blowing, as shown by the recording anemometer at Brooklands, at velocities of between 35 and 45 m.p.h. From Mr. Clement Greswell, one of our earlier pilots, and at present assistant manager of the Aircraft Company, I was able to glean a few particulars of this flight. The machine Verrier flew was destined for the Royal Flying Corps, and it was Verrier's intention to fly it over to Farnborough. About half-past eleven in the morning he made an ascent at Hendon to see what things were like, and although the wind was so strong that occasionally he seemed to be standing still, nevertheless he decided to fly straight ahead to the Royal Aircraft Factory. The wind was dead against Verrier the whole time, and although the trip to Brooklands is only a matter of 22 miles, his flying time for the distance was no less than 24.10 m. which gives an average speed over the ground of about 10 miles an hour.

Mr. Greswell followed the machine in the car, and whereas in the ordinary way in chasing an aeroplane one has to go "all out" to keep the machine in sight, in this case the difficulty was in exactly the opposite direction. Mr. Greswell had to stop several times and wait for Verrier to catch him up. Flying a 55 miles an hour machine in a 45 miles an hour wind needs a good deal of pluck and endurance on the part of the pilot, and so I beg to tender my heartiest congratulations to Verrier for his ability to carry out such a performance, and to the Aircraft Company for the excellence of the Maurice Farman biplane that enabled the feat to be accomplished.

It is quite a well-known thing on the aerodromes that a pilot, when turning on a monoplane, which has the propeller revolving in a clockwise direction as seen by him from his seat behind it, feels a good deal more wind on his face when turning to the right than when turning to the left. This is a little problem which will give readers, who are fond of such things, something to ponder over at Christmas time.

Mr. G. M. Dyott is back again in England from the States, where he was for some time in charge of the Sloane Aeroplane School. He had an interesting tale to tell of a lady he chatted with after he had been doing some flights out in Mexico city. He had previously been up to a fair height on his two-seater Deperdussin, and his lady friend remarked that flying so high must indeed be difficult. "Not in any way," replied Dyott, "it would be a great deal more difficult to fly from one

end of this ground to the other—the ground there was about a mile long and had an undulating surface—keeping a foot off the ground.” He was a minute before he could see the force of her innocent reply: “Well, what would you be doing with the other foot.”

Louis Blériot has again been experimenting with a *canard* type of monoplane. This one, however, is a good deal different from the one he was testing at Hardelot some months ago. It is larger, for one thing, being built as a two-seater, and is fitted with a 70-h.p. Gnome motor. The *fuselage* is perhaps the most curious part of the machine. For about three-quarters of

the total length of the *fuselage* it is a pure box-girder; the other quarter is formed by a pole, either of steel tubing or of the composite cork paper and linen construction that he used for the *fuselage* of this new machine at the Paris Show. This pole supports the forward “tail,” which in design is similar to those with which the old “Cross-channel” type of monoplane were fitted. In the chassis, Blériot has discarded his transverse leaf-spring idea in favour of his usual system of swivelling wheels mounted on deformable triangular supports. On this new *canard*, too, he has taken the rudder from the front of the machine and supported it on outriggers behind the propeller.

“OISEAU BLEU.”



BRITISH MACHINES IN ITALY.

GREAT success has been met with by that well-known pilot, Mr. Howard Pixton, who has lately been demonstrating the 80-h.p. Coanda-type Bristol monoplane to the Italian military authorities at Mirafiori, Turin. This monoplane is undoubtedly the finest specimen of service aeroplane that the British and Colonial Aeroplane Co., under the able direction of Sir George White, have yet turned out. That it may take its place as one of the leading machines of the day is evident from the fact that so many foreign Governments have added machines of this type to their air service equipment. On December 7th, Mr. Pixton continued the tests of one of these machines in the presence of Col. Moris, Commander General of the Italian Military Air Corps, Major Douhet, Commander of the Aviation Battalion, which has its headquarters at Turin, together with a large number of Italian military pilots. There were also present, representing the Bristol firm's interests, Mr. H. White Smith and Capt. Bertram Dickson. During the test

flights Mr. Pixton carried a passenger and a load of fuel sufficient for a 4½-hrs. flight. His best performance on that day was a straight a-head climb, fully loaded, to a height of 3,300 ft. in 13 mins. He thus established an Italian record. Descending, Mr. Pixton executed a spectacular spiral glide with highly banked turns, which earned for him the applause of all present and personal congratulations on his ability and the excellent handling of the machine from Col. Moris.

Two days after, accompanied by Capt. Bertram Dickson, as passenger, he put the machine through a speed test, carrying sufficient fuel for 5½ hours, a total weight, in addition to the pilot, of 350 lbs. The official speed given was 72 m.p.h. He gave passenger flights to various Italian military pilots on the following day, and they all, without exception, pronounced that they had never mounted a steadier and generally a more taking machine than the 80-h.p. Bristol monoplane.



A NOVEL BIPLANE.

AN interesting biplane has made its appearance at Hawkinge, near Folkestone, where Mr. W. B. Megone has been experimenting for some time past. His present machine is the outcome of several different types of heavier-than-air craft that he has constructed and discarded in reaching the type that he has at present arrived at. It will be seen from the accompanying photograph that while the engine is in front of the passenger, the propeller is driven by means of a shaft behind, and for this reason the machine has considerable interest from the military point of view, for it would be possible to mount an automatic gun in front of the passenger which would have an unhindered range in all directions forward. The machine has not yet been flown, but we understand it is to be put through its tests as soon as its constructor returns from abroad after the holidays. As a biplane its construction is rather different from what is regarded as conventional in this type of craft. Each plane is braced as a monoplane wing, and there are no compression struts between them.

The upper plane, it will be noticed, is stiffened by king-post bracing. The machine has an area of 440 sq. ft., not reckoning the tail, which is slightly lifting and which has an area of 54 sq. ft. The tail is supported by a fuselage, triangular in section, over the top member of which revolves the propeller. The two lower members continue forward below the machine to form landing skids. Propulsion is derived from a 60-h.p. Green motor mounted in front of, and on a lower level than, the pilot. It transmits its power through a steel shaft and a Hele-Shaw clutch to the 10-ft. propeller at the rear. The passenger, in this particular machine, sits behind the pilot, and his seat is such that he may raise it at will during flight, so that he may be able, if he needs it, to obtain a better view from the machine. He is able to get a good view of what is passing below him through Cellon windows let into the lower plane on either side. It is a curious feature that the control wires to the tail pass through the propeller boss.



Mr. W. B. Megone's interesting biplane photographed outside its hangar at Hawkinge, Folkestone.

FOREIGN AVIATION NEWS.

Garros' Height Record.

A GOOD deal of uncertainty appears to exist as to the exact figure of Garros' record high flight in Tunis last week. According to Garros the figure is 5,700 metres, but it is variously given elsewhere as 5,601 metres and 5,801 metres. The duration of the flight was 1h. 11m. 6s. At the time of Legagneux's record last September, it was given out that the height he attained was 5,720 metres, but this was subsequently reduced to 5,450 metres, the official record. It will be interesting to await the verdict of the Ae.C.F. Incidentally it may be noted that Garros' Morane was fitted with a Chauviere integral propeller.

The Latest Blériot XXXVI Bis.

AT the Blériot Flying Ground at Buc, Perreyon on Saturday last was testing the latest machine turned out from the Blériot works. It is the two-seater, which was shown at the recent Salon, in which the pilot and passenger sit side by side, and the special feature is that the fuselage is moulded in one piece. An 80 Gnome motor is fitted. The landing chassis is also of new design and fitted with pneumatic shock absorbers.

A Lengthy Flight at Pau.

ON his Blériot machine on the 5th inst., Lieut. Brule completed a flight of more than 250 kiloms. at a height of 1,500 metres over a circuit from Pau to Pontou-sur-l'Agaur, Tarbes and back to Pau.

Cross-Country on Farman Biplanes.

ON the 6th inst., Capt. de Goys, accompanied by a Sapper, arrived at Buc from Mailly Camp and Capt. Maurice, also with a Sapper, arrived at Chateaudun from Chartres. A little later he continued his journey to Chateau Renault.

Across Country on Deperdussin Hydro-Avion.

STARTING from Juvisy on Sunday week, Laurens, on his Deperdussin hydro-aeroplane, flew over the Seine and followed the course of the river to Corbeil, eventually returning over the same route.

Fine Work on Nieuport Hydro-Aeroplane.

STARTING from Meulan the other day on his Nieuport hydro-aeroplane Levasseur, accompanied by his mechanic and a full supply of oil and fuel, representing a total load of about 300 kilogs., flew over the Nieuport works at Issy, then making his way over the Seine alighted on the river between the Auteuil and Billancourt Bridges. In the afternoon he returned to Meulan.

Tetard Flies 290 kiloms.

ON one of the new Sommer biplanes, fitted with 70-h.p. Renault engines, Tetard, with Madame de la Roche as passenger, started from Mourmelon on the 5th inst., and flew over Rheims, Epernay, Nogent-sur-Seine, returning by way of Vitry-le-Francois and Chalons. The trip, which was about 290 kiloms. took 3 hrs. 20 mins.

Legagneux Touring.

ON his Morane monoplane, Legagneux on Thursday of last week started from Villacoublay at 3 p.m., and 40 minutes later landed at Compiègne. The next afternoon he started the return to Villacoublay, accompanied by a passenger, arriving safely just before dark.

A Caudron at Marseilles.

STARTING from the Pas-des-Lanciers on his Caudron machine, Maicon, on the 6th inst., flew over the outskirts of Marseilles and

through the Transporter Bridge. Although the wind was very troublesome, he successfully negotiated the return journey, and landed at his starting point after an hour's flight.

Buc to Rheims in Fast Time.

ON a two-seater R.E.P. monoplane, Amerigo, with a passenger, on Sunday week, made the trip between Buc and Rheims in 1 hour and 20 minutes, the machine carrying a load of over 300 kilogs.

Guillaux Again Over Paris Salon.

ON his 70-h.p. Gnome Clement-Bayard monoplane, Guillaux was again flying over Paris on Monday week. He circled above the Grand Palais, and also flew over the outskirts of Paris.

Guillaux a Superior Pilot.

ON his Clement-Bayard monoplane, Guillaux on the 10th inst. completed his tests for a superior *brevet*. He started from Issy,

and flew by way of Chartres and Orleans to Etampes and then back to Issy, a round trip of 200 kiloms.

Long Flying at Pau.

A TRIP of 200 kiloms. over a course from Pau to Mont-de-Marsan, Tarbes, and Pau was made by Lieut. Brule on his Blériot on the 10th inst.

High Work at Hanriot School.

AT the Hanriot school at Rheims on the 10th inst., Lieut. Menard put a 50-h.p. two-seater monoplane through some altitude tests. With a full load it climbed 1,000 metres in 6 mins., and 2,000 metres in 25 mins., while the descent took 8 mins.

New Deperdussin Superior Pilots.

ON the 10th inst. Lieuts. Zappelli and Devienne, on their Deperdussin monoplanes, at Rheims, carried out the height tests for their military certificates. Each was flying for over an hour at a minimum height of 1,000 metres.

An Hour's Flight by Gilbert.

ON the 10th Gilbert on his Rhone-engined Sommer monoplane made a flight of a little over an hour's duration, and for some time was flying over Paris.

Cross-Country on an Astra

STARTING from Villacoublay on his 75-h.p. Astra biplane Montmain, on the 10th inst., flew over to Etampes. In the afternoon he started back, and after making a stop at Chartres arrived safely at the Astra headquarters.

Mdlle. Marvingt Flying and Lecturing.

MDLLE. MARVINGT has been very busy lately giving lectures as well as flying her Deperdussin-Gnome monoplane, not to mention an occasional trip in a balloon. Last week she gave a lecture at Rheims on Alpine climbing and the last big game hunts of Latham. On the Friday she made an hour's flight on the Deperdussin, and later started from St. Cloud in a balloon, landing near Compiègne. On the 11th she gave her eighteenth lecture at Bar le Duc, the proceeds going towards the National Fund.

New Farman Superior Pilot.

ON the 13th inst. Lieut. Codot completed his qualifying tests for a superior *brevet* on a Maurice Farman machine, flying over a course from Buc to Mailly Camp and back.

Flight "Man-Birds."—X.

—From the original by Frank M. Williamson.



THE MUD-LARK.

Long Flights on Borel Machines.

ON Saturday last, at the Borel School at Buc, Lieut. de Vergnette was flying for an hour at a height of 1,200 metres, and Sergt. Clamadieu also made a flight of the same duration. On Monday Sergt. Pinsard, having completed the tests for a superior certificate, returned from Rheims.

Two Hours' Flight at Pau.

LAST Saturday saw some very good flying at the Blériot School at Pau, the longest being by Lieut. Cazes, who was up for two hours. Deneau also made a long flight over the town, while some good work was put in by a new British pupil, MacNeill by name.

Fine Flying on a Nieuport.

ON the School Nieuport, with two cylinder Nieuport engine, with which he has been doing such fine high flying recently, Sergt. St. Andre on Saturday made a flight of two hours of 2,000 metres, and starting from Villacoublay, passed over Velisy, Versailles, Buc, and St. Cyr. Lieut. de l'Estrade flew for a hour and a half round the country on a Nieuport.

Flying Caudrons in High Winds.

WHEN a French Military Commission visited Crotoy on Saturday, in order to witness tests with some Caudron machines, the wind was blowing at 46.5 miles an hour, but that did not deter Rene Caudron from demonstrating a couple of machines. These two biplanes were fitted with 25-h.p. Anzani engines, and afterwards M. Caudron intended to test one fitted with a 70-h.p. Gnome, but Capt. Destouches, who headed the Commission, said he had seen enough and did not wish M. Caudron to fly again.

Vedrine Flies from Issy to Chalons.

ON the 13th inst. Vedrine gave a lecture at Chalons-sur-Marne, and flew over from Issy earlier in the day. On the previous evening he lectured at Nancy, while he was speaking at Rheims last Saturday.

The Deperdussin School at Rheims.

AN idea of the very complete arrangements of the Deperdussin School at Rheims can be got from the fact that at the present time there are some thirty-three monoplanes of various types in commission there. The aerodrome is most favourably situated, and it is seldom indeed that there is not a machine in connection with this school in the air. On Sunday Lieut. Gauthier made a flight of an hour's duration.

Long Reconnaissance on a Nieuport.

ON a 100-h.p. Nieuport, Sergeant De Marmier on Saturday carried out a reconnaissance of 200 kiloms., with three landings—at Bouchior, Amiens and Doullens. During the trip the wind was blowing at times at 45 miles per hour.

Testing a Safety Parachute.

SOME little diversion was caused at Issy last week by the tests which were made with a parachute designed as a safety appliance for an aviator. At the entrance to the big dirigible shed a dummy aeroplane was rigged up with a dummy aviator in the seat, with the Odjek safety device behind him. The whole arrangement was then hauled up to the roof and suddenly upset, this throwing the "pilot" out, who, however, parachuted safely to the ground.

Chalons to Buc and Back on a Sommer.

ON one of the latest 70 h.p. Renault-Sommer biplanes, Lieut. Morel, accompanied by Lieut. Ragot, on the 8th inst., flew over from Mourmelon to Buc. On the following day he returned, and, as on the outward journey, took a couple of hours for the trip.

A Five-Metre Aviette Flight.

ON the 13th inst., at the Parc des Princes track, the well-known French cyclist, Didier, on his ordinary bicycle fitted with wings is reported to have succeeded in getting into the air and covering a distance of 5 metres, the greatest height being about 8 inches. Owing to darkness, however, Didier was unable to repeat this performance in the reverse direction, and so was not eligible for one of the Peugeot prizes.

A Deperdussin Flight in Belgium.

CROMBEZ on his Deperdussin monoplane flew from the Berchem Aerodrome near Antwerp to Kiewitt on the 3rd inst. The distance between the two towns is 80 kiloms.

Activity in Russia.

A REPORT just published by the committee which was formed to help on the cause of Russian Military Aviation shows that between February, 1910, and September, 1912, out of a sum of £170,660 about £100,000 was spent on the purchase of 90 aeroplanes and about £20,000 on the installation of the school at Sebastopol, where 60 officers have qualified for ordinary *brevets* and 23 have obtained their special military certificate. Several are still under instruction, and in addition 36 officers are going through a course of theory at the Polytechnic Institute.

Two American Aviators Lost at Sea.

IT is learnt by cable from Los Angeles that Horace Kearney and a passenger on his aeroplane, Mr. Chester Lawrence, who set out to fly across the sea from Los Angeles to San Francisco have not been heard of since they started on Saturday afternoon, and it is feared they have been drowned.

Queer Ending to Record Flight.

THE officers of the Argentine Army must be possessed of a very peculiar sense of humour. It is stated that on the return of Corporal Fels, after his trip from Buenos Ayres to Monte Video and back, he was placed under arrest for absenting himself from the country without leave. Not unnaturally, this aroused a good deal of indignation as the flight was generally recognised to be a magnificent one.



AERONAUTICAL SOCIETY OF GREAT BRITAIN.

Official Notices.

Meetings.—The fourth meeting of the Society for this session will be held on Wednesday, January 15th, at 8.30 p.m., at the Royal United Service Institution, Whitehall, when Professor W. C. Unwin, F.R.S., will preside. Mr. F. Handley Page, A.F.Ae.S., will read a paper, to be followed by a discussion, on "The Comparison of Monoplanes and Biplanes, with special reference to the stresses in each type."

Elections.—Mr. E. C. Midwinter has been elected a member of the Society. The following have been elected students of the Society:—John Chaloner, Manuel Cunha, W. F. Potter, G. Horsley Porter.

Students.—Students attending regular science, engineering, or aeronautical courses at recognized technical colleges, as well as those pursuing the scientific side of Aeronautics professionally, are eligible for the students' section, and should apply before December 31st if desirous of being admitted *without entrance fee*. Applications should be sent to the Secretary, 11, Adam Street, Adelphi, W.C.

The Council desires to thank Mr. Harry A. Turrill for the gift of a flying fish.

BERTRAM G. COOPER, Secretary.



KITE AND MODEL AEROPLANE ASSOCIATION.

Official Notices.

British Model Records.

Hand-launched ...	{ Distance ...	A. E. Woodard ...	477 yards.
	{ Duration ...	A. F. Houlberg ...	89 secs.
Off ground ...	{ Distance ...	G. Rowlands ...	230 yards.
	{ Duration ...	A. F. Houlberg ...	51 secs.
Hydro, off water ...	{ Duration ...	G. P. Bragg-Smith ...	25 secs.
Single-tractor screw, {	{ Distance ...	H. R. Weston ...	84 yards.
hand-launched ...	{ Duration ...	F. W. Jannaway ...	22 secs.

Official Trials.—The official observers visited the Aero Models (Northern Branch) flying grounds, at Finchley, on Saturday, 14th inst., to observe flights, but owing to the heavy gale it was impossible for any competitor to fly, so it was postponed, and the observers decided to hold the postponed trials on the same ground on Saturday, January 11th. Anyone, therefore, wishing to enter should forward their applications on the official form. Those who entered for these trials on Saturday last need not re-enter, as their applications will stand.

Aero Exhibition, Olympia.—All members and friends who intend exhibiting in the model section are asked to inform the secretary at once, if they have not already done so, so that an idea can be formed of the number of exhibits.

27, Victory Road, Wimbledon, S.W.

W. H. AKEHURST, Hon. Sec.



MODEL CLUB DIARY AND REPORTS.

CLUB reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Bristol and West of England (CLIFTON DOWN HOTEL, CLIFTON).

AN exhibition of model aeroplanes will be held at the Bristol Coliseum, in connection with the Winter Gardens opening on Boxing Day, and an exceptionally good display of models will be on view.

Leytonstone and District Aero Club (64, LEYSPRING ROAD).

DECEMBER 21ST and 22ND, flying as usual. December 25th, near Bushwood Avenues, at 10.30. Also flying Boxing Day; particulars will be announced to members at the meeting on December 25th.

Manchester Model Ae.C. (14, WARWICK RD. N., OLD TRAFFORD).

JANUARY 4TH, flying and general meeting at Heaton Park (boat-house, 2.30). Should inclement weather prevail, meeting will be held following Saturday.

Paddington and Districts (77, SWINDERY ROAD, WEMBLEY).

DECEMBER 26TH, model flying, 11 a.m. Competitions for seniors and juniors. December 28th, lantern lecture on "Hydro-aeroplanes," full-sized machines and models, by V. E. Johnson, M.A., at St. Andrew's Hall, Ealing Road, Wembley. Commence at 7.30. Admission, 6d.; reserved seats, 1s.

S. Eastern Model Ae.C. (1, RAILWAY APPROACH, BROCKLEY).

DECEMBER 21ST, at Kidbrooke, 2 p.m. to 4 p.m. December 22nd, at Blackheath, 8 a.m. to 10 a.m.; at Woolwich Common, 10.15 a.m. to 12.30 p.m.; at Chislehurst, 2 p.m. to 4 p.m. (by members of the Chislehurst and District Aero Club). Secretary will advise members of Christmas meetings on December 21st.

Yorkshire Ae.C. (Model Sec.) (53, WEST STREET, LEEDS).

DECEMBER 21ST, Poppy Fields, Beeston, 3 p.m. December 25th, Woodhouse Moor, 2 p.m. December 26th, Poppy Fields, Beeston, 2 p.m.

Models

Edited by V. E. JOHNSON, M.A.

"Flat" Plane Models.

SEVERAL correspondents have written to me relative to what they term flat plane models, *i.e.*, models in which the main plane or planes is constructed without any camber, *i.e.*, with flat ribs or no ribs at all. Some have written asking for information as to how such models can possibly fly. I should have stated that the main plane is fixed flat on the motor rod without any angle of incidence. Others again have asked which is the more efficient, or to speak more correctly which is the better to use, a cambered or non-

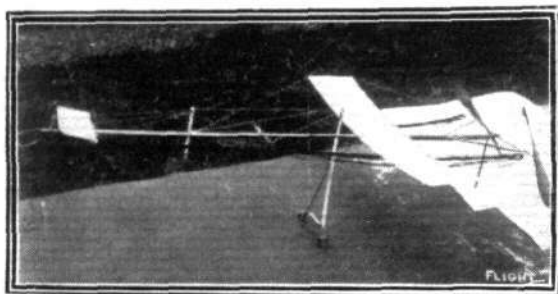


Fig. 1.—A "flat" plane model.

cambered plane, taking into account possible extra weight, resistance, stability, &c.

Let us first of all try and get a clear idea of what our correspondents mean when they speak of a flat main plane; they undoubtedly mean a model with planes like that shown in Fig. 1, in which the main plane is set flat on the motor rod without any angle of incidence, and has no ribs, *i.e.*, the main plane is just a rectangular framework, on which the fabric (silk) is stretched. The elevator is similarly constructed. The model is one constructed by the writer, some nineteen months ago, and in the Wakefield Cup Competition of 1911, it scored 84 marks out of a possible 100. In calm air, this model would rise off linoleum after a run of 4 ft., and sometimes less (less, of course, when facing a breeze), and when fully wound up, 900 turns, would remain in the air three-quarters of a minute. Out of 17 flights, its least duration was 28 secs., and its best 57 secs. It would rise to a considerable altitude, sweeping upwards in a left-handed spiral. Dimensions, &c.: length, 4 ft. 4 ins.; width of main plane, 29½ ins. Total weight, 6½ ozs., *i.e.*, weight of model, 4 ozs., rubber, 2½ ozs. (1¼ square). Length of rubber strands, 47 ins. Number of strands to each propeller, 14. Backbone T sectioned pitch pine, 4 ft. long, weight 1 oz., greatest thickness 1¼ in. Wheels made of hollow brass curtain rings with cross pieces of thin tinned-iron. Propellers, centrale type—diam., 11½ ins. Main plane and elevator constructed of satin-walnut, that of the main plane being ¼-in. wide by 1¼-in. thick. Dimensions, 29½ ins. by 5½ ins. Dimensions of elevator, 7½ ins. by 3 ins. The bearings for the propellers weighed half a gramme each. Jap silk gut was used to "stay" the model. As already stated, neither plane nor elevator were given any intentional camber, and the fabric (Hart's) was stretched as tight as was practical—it was fairly taut—no more. The main plane was placed flat on the backbone or motor rod, the elevator, of course, inclined; this inclination was such that the front or leading edge was about ⅜-in. higher than its back.

In the year 1911, a r.o.g. model which could give such results

as the above was not common, and the design or, to speak more correctly, the chief points in the design were fairly widely copied. To return, however, to the question of camber when such a model is in actual flight, under the consequent positive wind pressure on the under and negative pressure on the upper side of the fabric, a natural camber is formed, the extent of which depends partly on the wind pressure and partly on the tautness of the fabric. That such is the case can easily be seen by flying such a model (in which the fabric is not very taut) over a flat ground on a rather gusty day—choosing a spot where the wind "rolls" over the ground—such a model, when it encounters a down current, is straightaway put flat on the ground, the camber in this case being reversed. The advantage of using a properly cambered plane is that more lift is obtained at a fine angle, and at the expense of less resistance; in fine, it is a more "efficient" form.

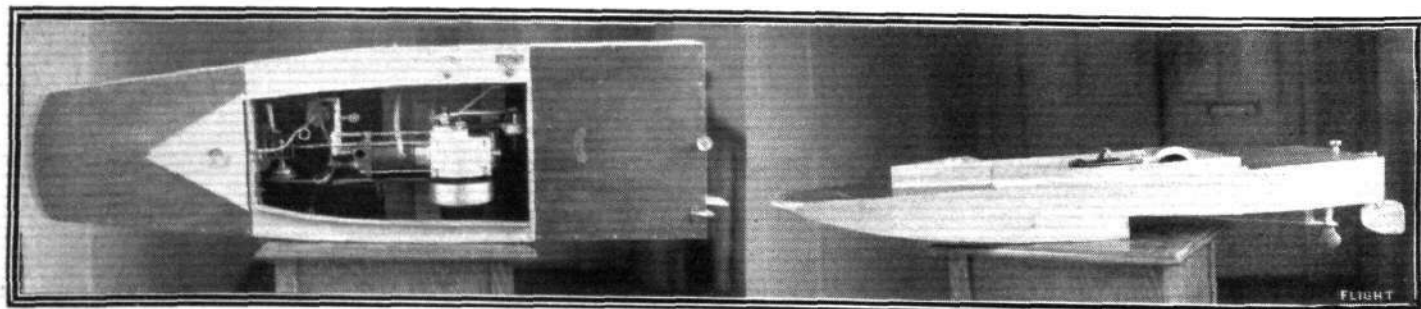
If the camber be large, some small loss in natural automatic longitudinal stability probably occurs owing to the well-known tendency of a cambered surface to "follow its own curve." But it is a mistake to use too great a camber. Suppose, however, that the planes shown in Fig. 1 were so constructed as to remain really flat when in actual flight, *i.e.*, supposing them constructed of very light wood, say, as in Clarke's flyers but without their camber, would such a model fly? The answer, founded on the personal practical experience of the writer is yes! Such a machine can be got to fly very well, although not, of course, so well as when a small camber is present. We will try to explain in untechnical language why this should be so. We have, it will be noticed, two flat surfaces rigidly connected, one of which (the elevator), has a positive angle of incidence, *i.e.*, the two planes therefore form a vee opening skywards, and such a system forms a proper system for longitudinal stability, the dihedral angle or vee given to both the elevator and main plane do the same thing so far as lateral stability is concerned. Imagine the motors and propellers wound up and the machine launched horizontally into the air. Leaving out the resistance of the air we have the push or thrust of the propellers tending to drive it straight forward, and its weight, *i.e.*, the pull of gravity tending to make it fall.

But it does not fall, in spite of the supposed non-lift of the main plane, supposed flat and quite horizontal; not only does it not fall but it may rise to some 20 or 30 ft. into the air, and make what appears to be a perfectly horizontal flight of, say, 100 yards before gliding to earth. In the first place, it must be remembered that the elevator is set at a positive angle, and is therefore capable of carrying a load; also, the load which it carries per unit area is greater than that carried by the main plane.

The elevator then prevents the nose of the machine from falling—the main plane (in fact, any body travelling through the air) always takes the path of least resistance—it is always advancing on to fresh air, *i.e.*, before it has any time to have dropped vertically it has advanced on to fresh air, and so on. It is very similar to a skater skating over thin ice; provided he skates fast enough, he passes on to fresh ice so quickly that before any particular section has had time to give the pressure is removed.

Of course, it is not perfectly correct to suppose that either the ice or the air do not yield somewhat, no matter however rapid the pace may be; but it must be remembered that so soon as our flat plane drops slightly it becomes virtually inclined, and therefore experiences more lift while dropping.

The reader should compare the above remarks with Prof. Langley's

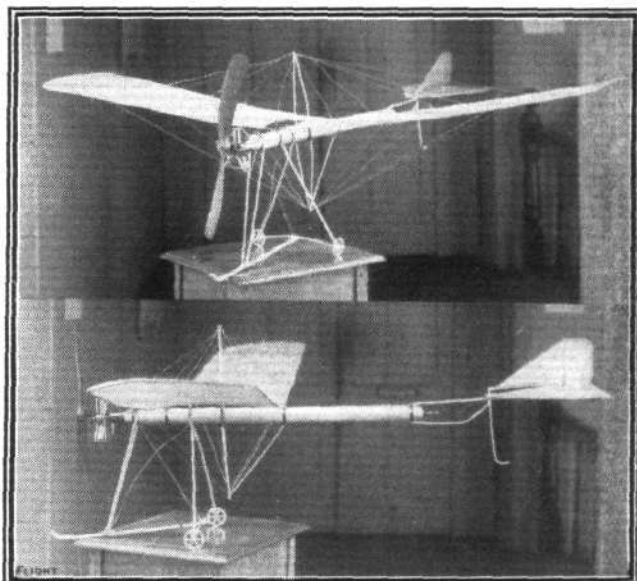


THE GAMAGE ½-H.P. SINGLE-SCREW PETROL-DRIVEN HYDROPLANE.—Speed, 14 m.p.h.; speed of engine, 3,000 r.p.m.; speed of propeller, 1,500 revs.; length, 4 ft.

experiments with what he termed his *plane dropper*, i.e., an arrangement by which he was able to investigate (up to a speed of 70 m.p.h.) the time of fall of a thin lamina projected horizontally in its own plane, he found that the time of fall increased rapidly with the horizontal velocity, and, at a given velocity, was greatest for a plane whose width from back to front was small in comparison with the length of the advancing edge—a result which we should naturally expect to be the case. The well-known principle of the boomerang also depends partly on the same principle. In this case it is the initial throw and spin of the boomerang (instead of propeller thrust and elevator) which keeps it edge on to the wind, because a spinning body has a strong dislike to change the axis about which it is spinning. It returns to the sender for the simple reason that it is easier for it to do that than to do anything else—in other words it always chooses the path of least resistance. Supposing it has travelled out from the sender in the half of an oval sweeping curve, at an angle inclined some 30° to the horizontal, and has arrived at the highest point of its flight. The force which has propelled it is used up—but it is still spinning. Gravity or the attraction of the earth, which has never ceased to act upon it, now has the upper hand and it commences to fall. It slides down the same plane by which it went up—the path of least resistance. To go in any other direction it would have to change its plane—and this its spin prevents it from doing. The model illustrated in Fig. 1 is essentially a “flying-stick” on wheels, as such it undoubtedly was quite a successful model.

Messrs. A. W. Gamage's Latest Power-Driven Model Aeroplane and Hydroplane.

We give this week some very clear illustrations obtained in Messrs. Gamage's great bazaar in Holborn, of the above. It will be noticed that both are designed on strictly scientific principles, and the general workmanship and finish leave nothing to be desired. As is clearly shown in the photographs, in the case of the model



GAMAGE MONOPLANE.—Compressed air pumped in with tyre pump. A speed of 30 m.p.h.

aeroplane, the compressed air cylinder also forms the backbone or fuselage of the machine to which the wings, tails, and chassis are attached in a very neat and simple manner; the model is of very light weight for a power-driven model, and being well-surfaced is able to fly with, comparatively speaking, a low power. The compressed air cylinder is charged with a tyre pump, the reservoir-valve being situated in the rear. The speed of the model is stated to be 30 m.p.h. The price, £6 15s. complete.

The model hydroplane has a $\frac{1}{2}$ h.p. petrol motor. Single propeller. Its speed 14 m.p.h. The speed of the engine, 3,000 r.p.m. Propeller speed, 1,500 r.p.m. Length of hydroplane, 4 ft. It will be noticed there is a distinct joggle or step, about midway in its length, the use of such in the case of a hydroplane: pure and simple is a necessary condition for efficiency, as I have explained in FLIGHT some time ago. Now that hydro-aeroplanes have become of such primary importance, many more experiments are likely to be made with power-driven hydroplanes, and, to anyone desiring to make such, the machine illustrated would undoubtedly be of considerable value. Moreover, such a machine could easily have wings attached to it and be, at any rate, turned into a skimming air-boat, even if it did not actually fly. It would be a most interesting experiment to test what effect such an alteration had upon its speed. The price of the machine as illustrated is £15.

Mr. Temperley's Query.

The following reply has been received from Mr. Temperley's Query from Mr. Oswald Hamilton, Junr.:—"I have not yet personally built a r.o.g. model, but have a design in hand (fuselage of which is completed), and owing to other calls upon my time, have practically gone little beyond the designing stage, so my remarks will not be those based upon experiment and trial.

"Dealing with the questions raised, in rotation, we first have 'the ratio of lifting surface to weight.' In the design I propose to build, I have allowed a load of 1 oz. to 20 sq. ins. of surface, the total weight of the model calculated to come out at 8 ozs., hence 160 sq. ins. of surface; this being proportioned as follows:—Main plane, 130 sq. ins. in area; elevator, 30 sq. ins. in area. N.B.—I should have mentioned that this model is one of the tail-first type.

"With regard to question two:—I have not actually worked out the weight of rubber in terms of the surface, i.e., effective lifting surface as not having had any flying experience with a model of this type, but with a view to an experimental comparison, I decided to fit twice as much rubber as I found successfully flew a hand-launched model of the same type, and which weighed 5½ ozs.; the amount of rubber used on the 5½-oz. model was one dozen yards $\frac{1}{4}$ in. strip which weighs, I believe, approximately $\frac{1}{8}$ oz., the surface of this machine is about 90 sq. ins., the extra proportion on the r.o.g. model allows for the overcoming of the resistance on the ground when machine starts under its own power. Hence in my proposed model the ratio of surface to rubber is 160 sq. ins. to $\frac{1}{8}$ oz. of rubber.

"With regard to the third question, here again Mr. Temperley's procedure in design is different from mine. I have not actually calculated the ratio of surface to thrust or pitch or diameter of propeller, but in designing or considering the blade area, pitch and diameter of propeller or propellers to be used, I take into account the chord of the plane, whether this makes the whole plane possess a high aspect ratio or a low one. In the design I have introduced into this letter, the chord of the plane is 6½ ins., with leading edge of plane 21 ins. in span, the trailing edge of plane is 19 ins. in span, so the model will have a low aspect ratio, hence, as it would not be logical to fit high aspect ratio propellers to a machine which is more or less designed to be a duration model, I propose fitting propellers of 9 in. diameter, width of blade in widest part 1½ ins., with a pitch at the tip of blade of 2 ft. Of course, this will not be the actual pitch as the propellers will be steamed from blanks cut out of satin walnut (the true pitch will be the average of the various angular measurements taken along the blade).

"In reply to question four: Total weight of machine to weight of rubber, this will be in the ratio of 8 ozs. to $\frac{1}{8}$ oz., where 8 ozs. is total weight of machine and $\frac{1}{8}$ oz. the total weight of rubber.

"As the subject matter of the above answer is only calculations prepared for an initial experiment with r.o.g. models, I should esteem it a favour if the calculations for the proposed design are not in accordance with the main principles that underlie the designing of r.o.g. models, if any reader would point out the weak points of design."

Protectors.

Reply to R. R. WESTON.—A protector is a loop of wire or cane placed on the nose of a model to act as a buffer or shock absorber in event of the model hitting something or somebody while in flight. It has absolutely nothing to do with the railing or roping round of the models while on exhibition.

Replies in Brief.

LEONARD OPDYKE.—We should certainly advise against the building of a monoplane glider; procure a copy of "How to build a 20-ft. biplane glider" (Spon and Chamberlain, New York), or consult Mr. T. W. K. Clarke. You will require an incline of about 1 in 4. Speed depends on surface. Commence by running against the wind on level ground, and making short jumps, then try a gentle slope, and so on. An active supporting surface of about 150 sq. ft. is sufficient to carry the weight you mention.

S. CAMM.—With respect to covering in the body this is a matter which I must leave to you—personally I should be inclined to cover it in with, say, a light varnished silk, which showed the construction through it. I do not see why you should not make a successful r.o.g. single propeller model—using two equal gear-wheels for rubber motor. You must, however, keep your weight down. Should not use a swept-back wing unless you have had experience with them—yes, I should use staggered planes. In reply to your last query—I doubt it.




Sparkling Plugs.

A MOST useful little treatise on the subject of "Sparkling Plugs—their design, choice, and use," by Mr. Alec M. Lodge, has just been issued by Messrs. Lodge Bros. and Co., and a copy will be sent to any of our readers who apply to the firm at their new address at Wrentham Street, Birmingham. The book is in no sense a catalogue, and contains a good deal of information which will probably be new to many readers.

Inclinometers.

A vertical scientific instrument, possibly a barometer or a specialized thermometer, mounted on a wooden board. It features a central glass tube with a scale on either side. The scale has markings and numbers, though they are difficult to read. At the top, there is a metal ring and several small cylindrical components. At the bottom, there is a large, rounded bulb. The entire device is secured to the board with screws.



1208

Just for Fun 2nd Mar 1912

HOW TO FLY.

BEING AN EXTRACT FROM THE DIARY OF
A. S. S. TRELAWNEY DINKS, ESQ.



EDITOR'S NOTE.—Some time since we received by post this manuscript, with a covering letter from a little girl, who explained that she had found it amongst some old papers belonging to her elder brother. As it had reference to flying, and as her elder brother was, or rather had been in his time a famous flying man, she thought perhaps it might be

more useful to us than to the waste-paper basket. We publish it for what it is worth, having previously ascertained from careful inquiry that the school mentioned in these notes is no longer in existence.

March 27th.—Hard up! Good idea! Will have a shot for next *Daily Mail* £10,000 prize. Must learn to fly.

28th.—Going town to inform boys of my decision.

29th.—Boys very enthusiastic yesterday. Am staying in bed to-day as there is such a thing as reaction.

30th.—Going to aerodrome.

31st.—Went aerodrome yesterday—got particulars—saw instructor—signed on—paid fee—looked at school aeroplanes—touched them. Looks quite easy!

April 1st.—Got "digs" near aerodrome. Bought aviator's suit, goggles, altimeter, fur gloves, helmet, and all the different things that the best airmen use. Went aerodrome—no flying. Wasn't any wind either. Instructor told me there were such things as *remous*. Suppose that's

some sort of weird state of the air that one can't see, but that one feels when one gets near enough to it. I like an element of mystery in things! Sat in machine and pulled things about, smoked a lot of cigarettes because it is apparently the thing to do. Determined to fly to Brooklands first time up, just to show the other boys the sort of stuff I'm made of.

2nd.—Got up 8 a.m.—went aerodrome—nobody about—mooned about until 10.30, then met other pupils. Told me they had all been out at 5.30 a.m. Dirty trick that! No flying rest of day.

3rd.—Woke 4 o'clock. Left digs, 4.2 a.m. Beastly rotten morning—cold and very wet. Determined to show them I am in earnest. Was first at aerodrome so took down shutters

of hangar. Beastly things shutters! Nearly let one down on machine. Waited till 8.30—very lonely, so fooled around with steel wire and pliers just for exercise. Went for breakfast. Very wet and miserable. Returned aerodrome 10.30. Everyone laughed except instructor—who told me not to mess about in future. Suppose shall make a start soon.

4th.—Fine morning. All out—my first lesson—cheero! Clambered into pilot's seat—monoplane this was—caught overalls on jagged bolt. Tore quite 12 inches out of seat—my trousers, not the aeroplane's. Rather proud if anything—honourable scars and all that sort of thing, don't you know. Instructor said "All you've got to do is this," and he waggled the lever about. Am beginning to understand now—the lever thing must be the thing you do it with. Then he said "Keep your tail down." It was as much as I could do all the time to keep my pecker up. "Now you know what to do, don't you?" I suppose I must have said "Yes," for someone twiddled the propeller thing round in front, and I thought the end of the world had come. The engine made a horrible noise, and fairly took my breath away. Started thinking that perhaps I shouldn't be able to think with that noise going on. Following conversation in shouts: "Have I got to go out in the rain?" Instructor said "That's not rain. That's only castor oil coming off the engine." Nice new overalls getting very greasy. Instructor bellowed "Advance lever." Took that to be an aviator's battle-cry, so shouted "Hoorah!" and waved my hand in castor oil shower bath. Expected to bound forward into the air so shut my eyes. Nothing happened. The thing in front stopped and everyone started talking at once. Recognised from the instructor's language that he was at least a gentleman. How could I be expected to know that "Advance lever" was not a battle-cry sort of expression? Wind got up, so pushed machine back in shed. Rather good morning's work.

5th.—Wet and windy. Spent day washing out castor oil.

6th.—Ditto. Ditto.

7th.—Ditto. Bought wrist watch.

8th.—Ditto. Sent town for large supply of cigarettes.



"Bought aviator's suit."



"Waved my hand in castor-oil shower bath."

9th.—Nothing doing.

10th.—Cleared up. Hamel flying. Will show him a few stunts when I get my *brevet*. (*Brevet* is the thing you get from the Aero Club for a guinea and two photographs when you can fly eights and things.) Lots of nice



"Spent quiet day at home reading all about why an aeroplane flies."

girls at the aerodrome—they seem rather drawn towards anyone who wears overalls. Felt unusually bucked. Wanted to wire to all my relations, but reckon mechanics ought to wear different colour overalls.

11th.—Nice day. More explanations as to what all the gadgets were for. Got in 'bus—that's the proper thing to call it. They started engine, I pulled back a lever, and was frightfully taken back to find they'd all left go. Didn't want them to do that. Haven't the faintest idea what happened, except that the sheds seemed to have taken it into their heads to play hide and seek with me. Fiddled violently amongst gadgets—suddenly a bang—engine roared louder than I've ever heard it roar before. Then silence, and I came to a dead stop. People were running towards me from all directions. Felt rather proud, for I hadn't hurt myself in the least, so got pencil ready for signing autographs. Found out propeller was smashed—wire had snapped and caught in it. No one seemed to take much notice of me, and eventually they wheeled the machine back to the shed. Wondered why no one had asked me to write my name in some album or other. Flying must be getting rather cheap if they've stopped doing that sort of thing. Wrote home and told my people all about it. Have at last made decided progress. Went down town and stood pals dinner at the Troc. in honour of myself.

12th.—Spent quiet day at home reading all about why an aeroplane flies—seems simpler than ever. Can't really be much more to learn now I'm getting to know what *x* means.

13th.—Got presented with a bill for 18 guineas for breaking a propeller. Rather a lot of money for a chunk of wood I thought. Refused to pay—argued—paid. (Always said 13 was unlucky).

14th.—Don't feel much like flying to-day. Even our best airmen get a bit nervous sometimes, so I watched the flying from behind a hedge in Colin Deep Lane. It started raining later, and as it didn't look like clearing up

thought perhaps after all I'd better go to the aerodrome. Very dangerous walking about on wet grass. Casually mentioned to other fellows that my feet were rather cold. Silly asses, they only laughed and said they thought so. Not the faintest idea as to what they mean. At any rate I must get some goloshes.

15th.—Fellow named Biff did a hop across the ground on monoplane 21B. (I wonder why they call it 21B, when it's the only machine they've got in the school? In one corner of the hangar there's an awful lot of little bits of wood and things. 20B I suppose.)

Well, when Biff was coming back towards shed he didn't come down early enough, so smashed into fence. Thought of a good joke, so said to him as he crawled out from underneath one wing, "I say, old chap, you've 'Biffed' that machine well in!" D'you know, he couldn't even see that joke, although to me it's plain enough. Simply scowled. Instructor said he might have saved that smash if he'd—

(1) Retarded the lever. (2) Pushed rudder-bar with left foot. (3) Pushed the cloche down. (4) Switched off.

Asked Biff in a kindly spirit why he didn't do all these things. What he said I'd better not stick down here as my people might see it.

Thought I'd take a tip from his smash and memorise those four directions in case I ever look like running into a fence or a church or anything.

16th.—Too windy for flying. Learned an awful lot of French words. It sounds much more impressive to hear a chap talking about the "*fuselage*" and the "*empennage*" than about the body and the tail of a 'bus. Learnt that the "*cloche*" is the thing that you control the *gauchisse-*



"I say, old chap, you've biffed that machine well in!"

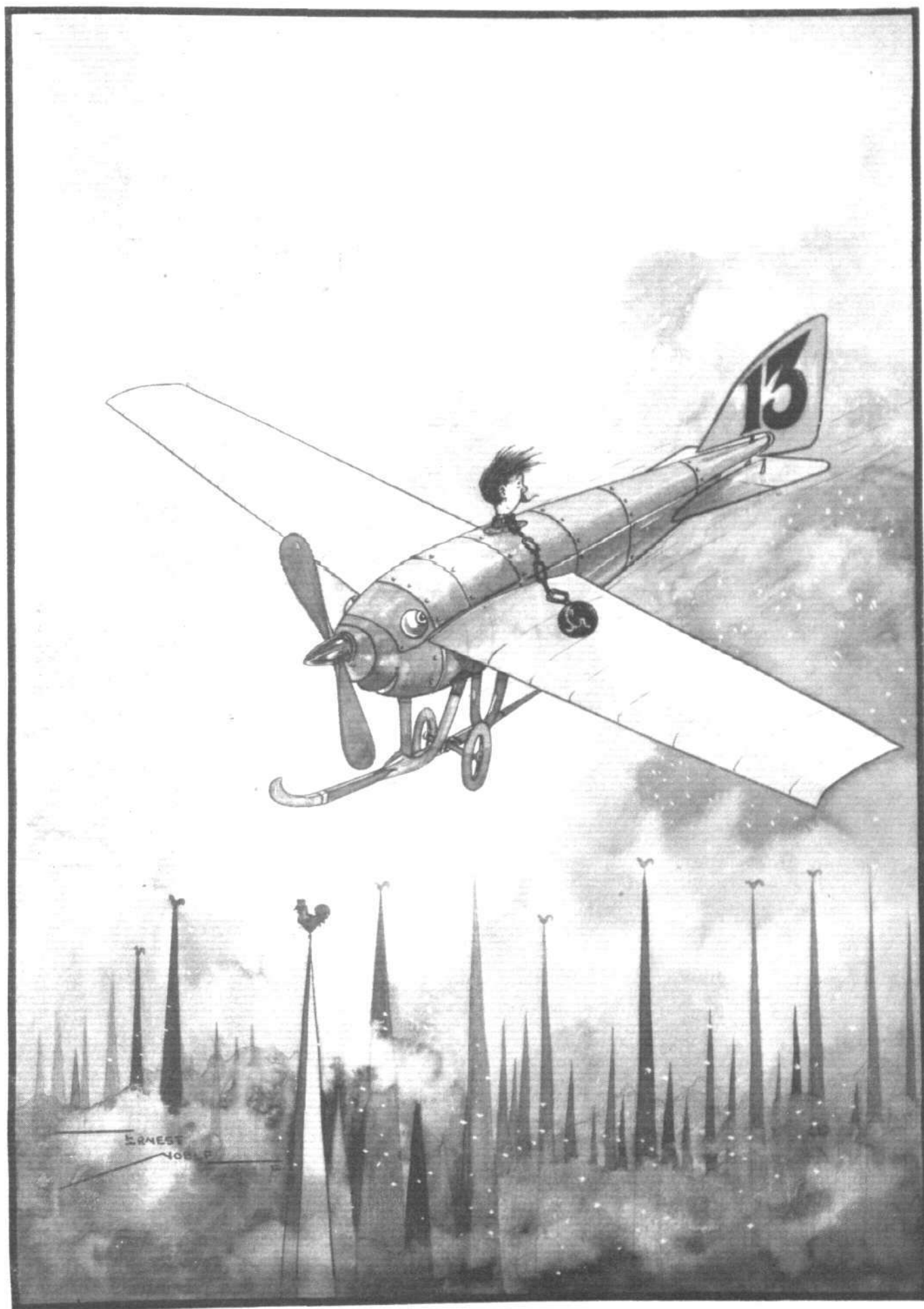
ment and the *gouvernail de profondeur* with. So simple when you know! My people *will* be pleased.

17th.—Strolled about enclosures. Some silly ass asked me if I'd ever had a "pancake"—told him I'd had dozens, and casually mentioned I'd broken a propeller the other day. Undoubtedly very impressed. Took my photo—must buy *Daily Mirror* to-morrow. Hamel and Grahame-White doing passable "stunts." Nothing new though. Want new blood—glad I'm getting on so well.

18th.—Another accident to-day. Started off in customary shower-bath of oil. Intended going up about 50 feet to see what the weather conditions were like. Anemometer was registering zero but the thing's all wrong. You've got to add on 75 per cent. of whatever it says if you want to know what the wind's *really* blowing. Let's see—75 per cent. of 0 is —, well, I reckon it was blowing about 25 miles an hour at the time.

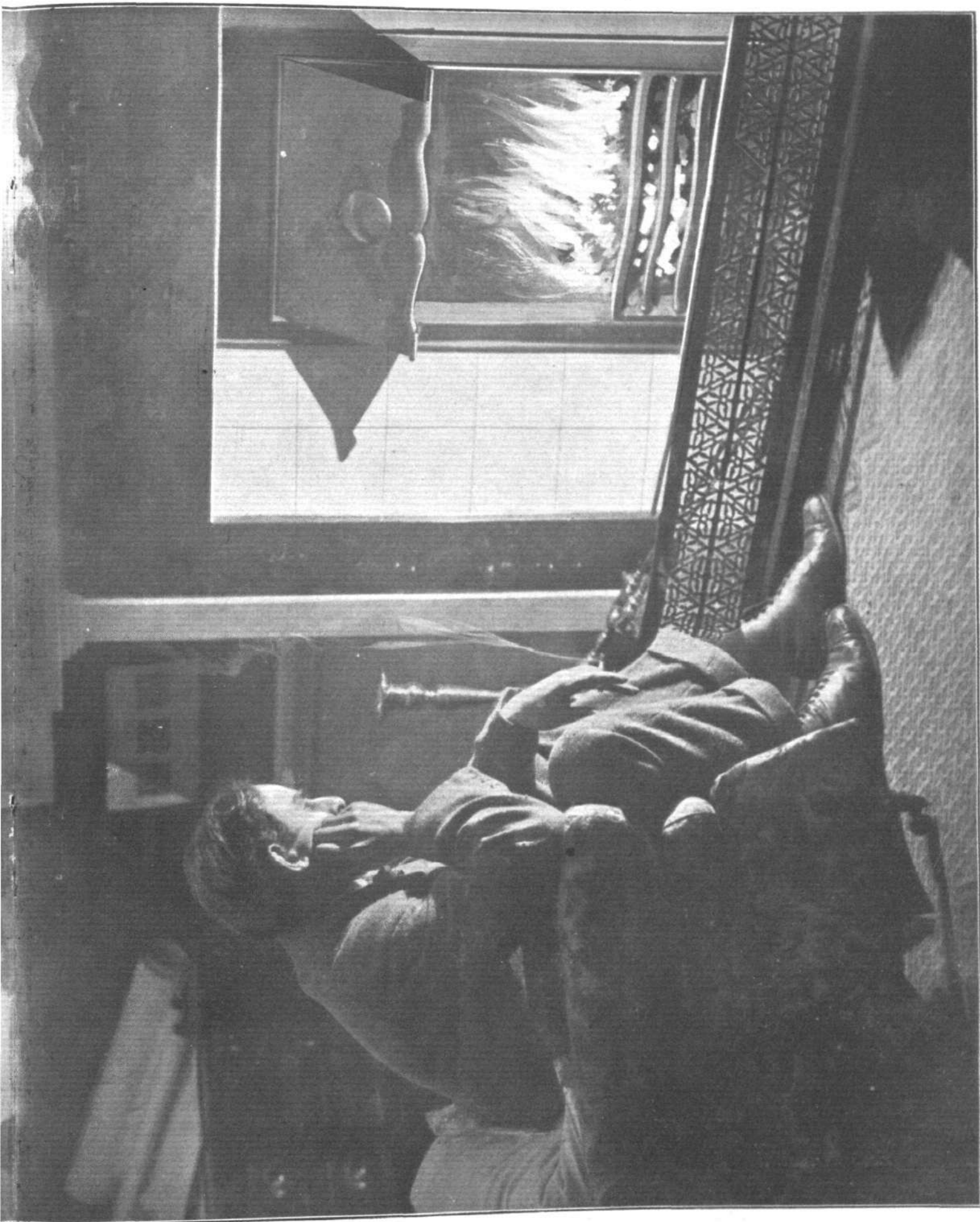
But before I'd even got my tail up the engine petered

The Stuff that Dreams are Made of.



The combined result of a passenger flight at Hendon followed by Christmas fare.





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FIRESIDE REFLECTIONS.—The passing of 1912.

[Toned photographic enlargements of this plate can be had. For particulars see inside back cover.]

Christmas Cheer in 1920.



HAPPY ARTHUR: "An' y'ackshally 'ear some fellers talk abaht the good old-fashioned Christmas!"

out and stopped. Swear I didn't even touch any of the gadgets. Took 'bus back to shed and as they started pulling engine to bits, cleared off home to write my people how glorious flying is.

Learnt a good tip to-day. Must always call myself "Trelawney-Dinks" in future. "Dinks" is really too commonplace a name to have when you can fly. Must get some cards done.

Getting to look more like an aviator every day. Bought a white muffler, but took good care to use it to clean my motor bike with before I wore it. New mufflers look so painfully clean.

19th.—Fine day. Went aerodrome. Was told I—yes, me! had broken something inside the engine. £10 worth of damage done somehow. Naturally refused to pay as I hadn't touched the wretched thing—argued—paid.

20th.—Wet. Fed up with aviation.

21st.—Windy. Fed up with aviation.

22nd.—Wet. Fed up with aviation.

23rd.—Windy. Fed up with aviation.

24th.—Wet and windy. Fed up with aviation.

25th.—Windy and wet. Fed up with aviation.

26th.—Fine day at last—went aerodrome. They'd run out of castor oil. Served them jolly well right, thought I. Instructor explained they couldn't run the engine without castor oil (I always thought petrol made the thing go). Instructor, who seems to be getting quite attached to me, sympathetically asked me if I'd still got "cold feet." Naturally I explained that since I'd bought goloshes—and just here they all laughed for no apparent reason.

No flying until oil comes.

27th.—Pretty good day but no flying as oil hasn't arrived. Had dinner at Maxim's with some of the leading flying men of the day.



"New mufflers look so painfully clean."

28th.—Saw one of Shanthurt's pupils turn a 'bus right over. Took the trouble to fag over to the smash and tell him he ought to have (1) retarded spark lever (2) pushed *barre de pied* with left foot (3) pulled *cloche* (4) *coupé le contact*. He didn't seem at all grateful, and I refrained from putting down what he said, because (a) there was too much of it (b) a lot of his expressions I'd never heard before (c) what I did recognise as having heard before I won't stick down for the same reason as previously suggested.

At any rate, I know how to avoid a smash if he doesn't! Serves him right if he smashes up more

machines. He ought to respect the advice of one who really does know.

29th.—Fine day again. Got out machine. Started raining—pushed it back again. Cleared up—got out machine again. Rain came on once more. Took machine in again for the second time. Kept on raining for the rest of the day. This sort of thing can't go on—



"Am quite a hero at home."

people will soon begin to think I'm not trying to learn to fly. Made instructor promise me first go on the machine in the morning. Wonder how long it will take to get over to Brooklands. Awfully jolly idea having a little fly round every morning before breakfast. My word! won't my people be jolly bucked.

30th.—

[There is an ominous absence of entries from May 1st till June 1st.]

June 2nd.—Still feeling very dicky. Looking back over my diary I find that on May 29th the instructor promised me I could have the machine first on the following morning. Have just got a faint idea of what occurred. I remember starting off and (1) pulling lever, but must have pulled it the wrong way, for the 'bus went faster still. Then I (2) pushed left foot—or at least meant to do so. I suppose I must have tried to overdo it by pushing both. At any rate nothing seemed to happen and by that time I must have been going an easy 70 over the ground. Shut my eyes, not voluntarily, but owing to a big clot of castor oil catching me right on the nose—hard too. Had to do something as I was getting perilously near the fence. I (3) pulled the *cloche* as hard as I could. Through a hazy film of castor oil I saw the fence start disappearing into the earth. Realized I was off ground. Frightful shock. Must have (4) switched off, for barring an awful crunching noise I don't remember much else. My people told me yesterday they picked me up in the next field, so I jolly well must have flown over that fence. That's proof positive enough that I can fly, at any rate. Don't think I shall trouble to fly any more. A lot of the interest seems to have gone, now that I know how to do it. Am quite a hero at home. Shall hate to have to take off these bandages because people are so kind and inquisitive and sympathetic. Pater's a bit out of sorts to-day. Bill for smash came by post this morning.

[Another ominous omission of entries.]

6th.—Have gone into the Pater's business.

"The Younger Generation."



The ship that never came back.